ARE SIBLING ROLES ALTERED WHEN ONE CHILD HAS DIABETES?

By

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WHEN ONE CHILD HAS DIABETES?

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This study addressed sibling roles in families where one child has diabetes. Subjects consisted of 48 families who had second-borns with diabetes and 48 families who had second-borns without diabetes. Parents and first-borns were interviewed about how many hours per week first- and second-borns spent performing household chores and outside of home activities.

The amount of time spent doing chores and activities was examined based on respondent (parent or child), health status of the second-born, and the child's age, birth status, and gender. Children engaged in approximately 10.3 hours of work per week. Respondents had similar perceptions of how much work was performed by first-borns. However, parents felt that second-borns performed more work than was reported by first-borns. Older siblings' performance of

chores was not affected by having a younger sibling with diabetes. Children with diabetes performed more chores than healthy peers and appeared to be "super" capable. Excluding diabetes care, age was positively associated with the amount of chores children performed. One exception was that parents perceived adolescent and preadolescent first-borns who had a younger sibling with diabetes to have equal responsibilities. Controlling for age, sibling care was the only type of work that was associated with birth order. Gender was not as predictive of household work as in previous studies.

The amount of outside of home activities engaged in by first-borns was not affected by their sibling's health status. Male second-borns who had diabetes performed more outside of home activities than female second-borns with diabetes. The amount of activities a child performed was affected by their own health status but not their sibling's health status.

CHAPTER 1

INTRODUCTION

Roles are a set of expectations family members have for one another's behavior. Sibling roles warrant further research as the relationship between siblings is often both complex and powerful. Research has indicated that gender, age, and birth order influence sibling roles (Abramovitch, Corter, & Pepler, 1980; Bigner, 1974; Brody, Stoneman, & MacKinnon, 1982; Brody, Stoneman, MacKinnon & MacKinnon, 1985; Lamb, 1978; Minnett, Vandell, & Santrock, 1983; Stoneman, Brody, & MacKinnon, 1986), including sibling household and caretaking responsibilities (Blair, 1992; Cogle & Tasker, 1982; Etaugh & Liss, 1992; Lawrence & Wozniak, 1987; White & Brinkerhoff, 1981b).

Sibling roles may be altered if one child in the family has a chronic illness or handicap. More specifically, role differences between siblings may be exaggerated when one of the siblings has a chronic illness or handicap. An older healthy sibling may interact in a more dominant manner with a younger ill child and may be expected to perform more household responsibilities than peers of similar age and birth status. Female siblings of children with a chronic illness or handicap may perform more child care and

household responsibilities than their peers who have healthy siblings. A younger, healthy sibling may take on the roles that are typical of an older sibling when the older child has a chronic illness or handicap. Age and sex roles may change significantly when one child has a chronic illness or handicap as expectations of parents are reformulated for each sibling.

The stress of having a child with a chronic illness in the family may be directly associated with these role changes. Families of children with insulin-dependent diabetes mellitus (IDDM), the target group for this study, are thought to experience significant stress secondary to the ill child's medical condition. A child with IDDM has a complex, daily regimen which includes the administration of insulin, blood glucose monitoring, diet restrictions, and exercise. Parents are often highly involved with the medical regimen of younger children and become less involved as children become older (Allen, Tennen, McGrade, Affleck, & Ratzan, 1983; Anderson, Auslander, Jung, Miller, & Santiago, 1990; La Greca, 1982). La Greca, Follansbee, and Skyler (1990) found that even during adolescence, parents often still assume primary responsibility for diet-related aspects of the regimen while daily monitoring and injections are performed by the adolescent. The research also indicated that girls have more responsibility for their own care compared to boys (Anderson et al., 1990). Thus, age and sex

of the affected child may influence family members' disease-related roles and responsibilities. However, it is also possible that the presence of a chronically ill or handicapped child affects family members' roles and responsibilities in other, non-disease-related contexts as well.

CHAPTER 2

REVIEW OF THE LITERATURE

The Developmental Literature

In this section, the sibling literature relevant to roles in the family will be discussed. First, research addressing the quality of the sibling relationship and the way siblings interact with one another will be reviewed. Following this, the responsibilities of household chores and child care will be discussed as these tasks are associated with role development in the family. The effect of sex, birth order, and age on sibling interactions and distribution of household responsibilities will be highlighted. The section will conclude with a critique of the methods and measures of the developmental research concerning sibling roles.

The Sibling Relationship

The sibling relationship is unique as it allows for extremes in feelings and behaviors between children. For instance, when fifth- and sixth-graders described their sibling relationships, they reported both positive and negative aspects (Furman & Buhrmester, 1985). They described their sibling as their friend and companion, often admired their sibling, and talked about receiving positive

attention and affection from their sibling. The same group of children also indicated negative aspects of the relationship such as frequent, intense quarrels and antagonism. Furthermore, as children progressed through middle childhood, they spent less time with their siblings but perceived no subsequent change in sibling intimacy, affection, and admiration (Buhrmester & Furman, 1990).

The quality of the sibling relationship may be related to gender composition, but results in the literature are mixed. Some researchers found that same-sex siblings have greater feelings of warmth and closeness compared to opposite-sex siblings (Buhrmester & Furman, 1990; Furman & Buhrmester, 1985; Stocker, Dunn, & Plomin, 1989). Same sex-siblings were also observed as being less controlling and competitive and were rated by their mothers as having a more positive relationship than mixed-gender pairs (Stocker et al., 1989). While Buhrmester and Furman (1990) reported similar findings for female-female siblings, only a nonsignificant trend was found for a more positive relationship in male-male siblings, suggesting that male siblings may have a less positive relationship than female siblings. Consistent with this, school-age sisters were found to display high levels of prosocial behavior while pre-school male siblings were found to display high levels of antagonistic behaviors toward one another (Brody et al., 1985). Brothers were also found to spend less time together

than any other sibling group (Stoneman et al., 1986). However, Stoneman et al. (1986) also found that older siblings in cross-sex dyads exhibited more positive verbal statements directed toward their younger sibling than older siblings in same-sex dyads. Yet another study found no effect of gender composition on the quality of sibling interactions during the second born's infancy (Dunn & Kendrick, 1981). However, this may be a result of the young age of the children and the novelty of having a new member of the family. In summary, there was more support in the literature for a positive relationship between female sibling pairs than between male sibling pairs.

Closeness in sibling age was also examined. One study indicated that closer age spacing between siblings fostered greater closeness but also greater conflict in the sibling dyad (Furman & Buhrmester, 1985). However, other studies found no relationship between age spacing or sex composition and sibling behavior (Abramovitch et al., 1980; Pepler, Abramovitch, & Corter, 1981). Thus, age spacing is inconclusive as a predictor of the sibling relationship.

Birth order appeared to be strongly related to the relative power or status in the sibling relationship (Furman & Buhrmester, 1985). Older siblings were perceived by family members as possessing more power than younger siblings (Bigner, 1974). However as discussed previously, the relationship between relative power and birth order may

be incidentally related to siblings' relative age difference. One study, using groups of unrelated children, found that children interacted differently depending on the age of their playmate (Lougee, Grueneich, & Hartup, 1977). Findings indicated that same-age, approximately 5-year-old, children had more social interaction and verbal communication than mixed-age children (approximately 3- and 5-year-olds) (Lougee et al., 1977). Furthermore, Berndt and Bulleit (1985) found differences between the peer-peer interactions and the sibling-sibling interactions of preschoolers that appeared to be associated with relative age differences. Children with younger siblings had a more dominant role when interacting with their siblings than children with older siblings. Peer-peer interactions were more egalitarian (Berndt & Bulleit, 1985). It was difficult to distinguish between age and birth order in most research as these two variables often overlap.

Research examining age or birth order effects found that older children typically have the dominant role in the sibling relationship (Abramovitch et al., 1980; Bigner, 1974; Brody et al., 1982; Lamb, 1978; Minnett et al., 1983; Stoneman et al., 1986). Observations of sibling interactions showed that older siblings, regardless of gender, frequently directed teaching behaviors and praised their younger sibling while younger siblings were less likely to exhibit these behaviors (Minnett et al., 1983).

In addition, older siblings most often assumed the dominant role of teacher and manager in the sibling relationship (Brody et al., 1982). Furthermore, Baskett (1984) found that younger siblings, regardless of gender, emitted more negative behaviors (e.g., noncompliance to commands, negative physical contacts, throwing tantrums, and demanding attention) toward older siblings than vice-versa. No significant results were found for positive behaviors.

Patterns of interactions between siblings based on sex differences were also described in the literature. Girls (four through seven-year olds) appeared to have more direct contact with their infant siblings than boys (Blakemore, 1990). Similarly, girls were observed to exhibit more prosocial and teaching behaviors toward their siblings than boys (Abramovitch et al., 1980). Girls' affiliation with their mother during their younger siblings' infancy was correlated with later sibling behavior (Dunn & Kendrick, 1981). First-born girls who had intense positive relationships with their mothers, characterized by frequent play, maternal attention, and infrequent prohibition, were more likely to have negative interactions with their younger siblings in early childhood (Dunn & Kendrick, 1981). These investigators also found that when mothers intervened in fighting between their sons by prohibiting instead of distracting, their sons exhibited more aggressive behaviors six months later (Kendrick & Dunn, 1983).

Caretaking behaviors were observed most often in older, female siblings (Stoneman et al., 1986). Older girls were typically the managers of their younger sibling's behavior and often directed positive physical contact toward their sibling, regardless of their sibling's gender (Stoneman et al., 1986). However, female first-borns were more likely to exhibit teaching behaviors to their younger sibling when their sibling was also female. While gender was predictive of first-borns' behavior directed toward their younger sibling, it was not predictive of second-borns' behavior directed toward their older sibling.

Sex Role Attitudes and Stereotypes

Sex role stereotypes are important as they relate to sex differences in sibling roles. This construct was formulated by Edelbrock and Sugawara (1978) as part of their Sex Role Learning Index (SERLI). Children were shown pictures of objects and asked if the objects were typically used by females or males. SERLI results indicated that boys had a higher preference for objects which depict the masculine role than females had for objects that depict the feminine role (Edelbrock & Sugawara, 1978). Other research has found that though both sexes have strong sex-typing at early ages, girls' gender-typed toy preferences decline with increasing age while boys' toy preferences remain relatively stable (Bussey & Bandura, 1992; Etaugh & Liss, 1992; Kohlberg & Zigler, 1967). Society's tendency to accept

cross-sex preferences more readily in girls than boys may allow girls greater freedom to choose opposite gender-typed toys.

Sex role discrimination was also examined in relation to specific sibling characteristics. A study using the SERLI found that girls with older brothers and boys with older sisters had less gender stereotyping of "feminine" objects than same-sex siblings (Stoneman et al., 1986). Contrary to these findings, Grotevant (1978) studied adolescents and found that younger children with a same-sex older sibling had less gender stereotyped interests than children in mixed-sex dyads. These contradictory results may be a result of developmental effects. Stoneman et al. (1986) examined the sex role attitudes of younger siblings (age 4.5 to 6.5) and Grotevant (1978) examined the attitudes of adolescents. These studies suggested that the effect of gender composition on sex role attitudes of younger siblings may change as a child ages.

One study found a developmental shift in sex role attitudes for girls that was independent of birth order. Meyer (1980) concluded that younger girls' (first and second graders) sex role attitudes are based on identification with societal norms while older girls' (fifth and sixth graders) attitudes are based on identification with their mothers' views. Specifically, younger girls shared similar sex role attitudes with each other, while older girls and their

mothers displayed similar sex role attitudes. Thus, as children grow up their attitudes change from being similar to their peers to being more congruent with their mothers. However, research suggested that even as young as two years old, girls' behaviors are associated with the sex-typed beliefs of their mother (Brooks-Gunn, 1986). For example, in this study, low sex-typed mothers had more active daughters.

Siblings' sex role attitudes have also been studied in relation to function (e.g., instrumental or expressive types). Bigner (1974) found that children typically assign interference actions to male figures, especially if the child has an older male sibling, and facilitation actions to female sibling figures, especially if the child has an older female sibling. Age spacing was also found to effect children's assignment of function. Inconsistent with above-mentioned results, boys closely-spaced with an older female sibling assigned more facilitation items to male sibling figures and more interference to female sibling figures (Bigner, 1974).

Studies suggested that younger siblings are more influenced by older siblings sex role attitudes than vice-versa (Grotevant, 1978; Stoneman et al., 1986). In unstructured play situations, Stoneman et al. (1986) found that same-sex siblings most often selected corresponding sex-typed activities while cross-sex siblings most often

selected activities corresponding to the oldest sibling's sex. Younger siblings may be more influenced by older siblings as older siblings have been found to be more powerful in the sibling relationship (Bigner, 1974; Furman & Buhrmester, 1985). Most younger siblings reported that older siblings were more powerful except boys who were spaced close to an older sister.

Few studies have addressed the relevance of the sibling relationship for the development of sex role attitudes. The possibility of developmental effects contributing to sex role attitudes adds further complexity to an already difficult area of inquiry.

Household Responsibilities

Most children take on household responsibilities but studies have been inconsistent about the exact amount of time children spend performing household chores. The number of hours of domestic work that children perform per week ranged from 3.5 hours to 8.4 hours across studies (Blair, 1992; Cogle & Tasker, 1982; Sanik, 1981). Blair (1992) found that children perform an average of seven hours of household labor per week, representing a significant portion (12%) of the total work load.

An important component of role development in siblings is their assignment of household tasks. Most parents perceived the assignment of household chores as a means of developing responsibility, future skills, and character

(Goodnow & Delaney, 1989; White & Brinkerhoff, 1981a). This is interesting as further research has shown a positive association between the amount of household responsibilities and prosocial behavior in children (Rehberg & Richman, 1989; Richman, Berry, Bittle, & Himan, 1988). Few parents reported purely extrinsic reasons (e.g., parents need for help) for explaining why children should help with household responsibilities (White & Brinkerhoff, 1981a). Besides the developmental meaning of children's work, parents also perceived their child's involvement in family tasks as signifying belonging and sharing among family members.

An example of children's roles being defined by age and sex is found in the household work research. Research found that age was positively associated with amount of household responsibilities assigned to children (Cogle & Tasker, 1981; Lawrence & Wozniak, 1987; White & Brinkerhoff, 1981b). Older children spent more time performing household chores than younger children. They also performed more caretaking responsibilities than their younger siblings (Daniels & Plomin, 1985). Goodnow and Delaney (1989) found developmental shifts of both the quantity and type of domestic work expected of children. They formulated two categories of domestic tasks that children perform in the home. The first category was self-care tasks which the child performed to care for themselves such as making their bed, cleaning their bedroom, and clearing their dishes. The

second category was family-focused tasks which included setting the table, cleaning the living room or kitchen area, preparing meals for the family, and doing the family's laundry. Using these categories they found that young children were asked to do self-care tasks and as they matured were also expected to participate in family-focused chores. The age of each sibling directly effected parental assignment of domestic responsibilities and most likely their expectations of the capabilities of each child. There is also a significant literature on sex differences of household responsibilities among siblings. Gender was found to be the best predictor of the amount of chores performed in the household, with females performing the most household labor (Blair, 1992; Etaugh & Liss, 1992, Lawrence & Wozniak, 1987). For example, one study found that female children averaged 6.7 hours per week while male children averaged 4.9 hours per week of domestic work (Blair, 1992). Blair (1992) found that children spend most of their time (78%) performing chores in the areas of meal preparation, washing dishes, cleaning house, washing clothes, and ironing. These chores are all traditionally female stereotyped jobs in the household. Even though girls performed significantly more family work than boys, there was no gender differences between self-care responsibilities (Goodnow & Delaney, 1989). In addition, girls rarely were involved in traditionally male stereotyped tasks such as cutting the

grass, doing small household repairs, or washing the car (Goodnow, Bowes, Warton, Dawes, & Taylor, 1991; Lawrence & Wozniak, 1987). However, these jobs are less time consuming than traditionally female tasks which are typically performed on a daily basis.

The one variable that may diminish these sex differences is family size. Larger families tend to have less female gender stereotyping as the need for traditionally feminine tasks is high (White & Brinkerhoff, 1981b). Male gender stereotyping for specific chores is usually still evident in large families unless there are no male siblings in the family (White & Brinkerhoff, 1981b). Female siblings were more likely to be involved in male stereotyped chores such as yard work when there were no male siblings. Besides the shift in family chores, children from larger families were also expected to perform a higher quantity of self-care responsibilities (Goodnow & Delaney, 1989).

Studies on household responsibilities most often overlooked child care responsibilities. Blair (1992) found that children with younger siblings had less household responsibilities than those without preschool siblings. This may be because they were assigned child care responsibilities but this was not addressed in Blair's (1992) study. There were two studies that addressed child care responsibilities in relation to sibling characteristics

(Daniels and Plomin, 1985; Stoneman et al., 1986). One study found an association between age of sibling and the assignment of child care tasks (Daniels & Plomin, 1985). Another study found that in combination, sex and age, are powerful predictors of household responsibilities, as older girls had the most child care responsibilities (Stoneman et al., 1986).

There were a few other variables that were significantly associated with domestic responsibilities in the literature besides age and sex. The importance parents place on children's scholastic accomplishments and the quantity of parent-child interactions were both inversely related to the number of chores a child performed (Blair, 1992). In addition, Stewart and Marvin (1984) observed the caregiving system of siblings in a modified "strange situation" where children were left alone with their older siblings and their interactions were observed through a one-way mirror. Slightly more than half of the older siblings were classified as "social perspective takers." Social perspective takers were defined as children who were able to make accurate inferences about another person's view in a social situation. These children showed the most caretaking behaviors (e.g., approaching, caressing or holding, offering verbal reassurance, and redirecting attention) directed toward their younger sibling when their parents were unavailable (Stewart & Marvin, 1984). Parents also reported

that they were more likely to ask the "social perspective takers" to provide care for their younger sibling on a daily basis.

Demographic variables that may be important in further research include employment status of the mother, socioeconomic status, and who the child lives with (e.g., one parent or two parents). There are mixed findings regarding the association between mother's employment status and children's household responsibilities. One study found that children's labor in the home increased significantly when their mother was employed outside the home (Blair, 1992). Other investigators found no relationship between amount of household responsibilities and mother's employment status (Goodnow & Delaney, 1989; Peters and Haldeman, 1987). Cogle and Tasker (1982) found that children with mothers who worked full-time had the greatest amount of household responsibilities, children with mothers who were not employed outside the home had less responsibilities, and children whose mothers worked part-time had the least. Lawrence & Wozniak (1987) found that mother's employment was only associated with the amount of time children spent in two household tasks: food preparation and dishwashing. Similar to Cogle and Tasker's (1982) findings, children of mothers employed full-time had the most responsibility for these tasks while those with mothers employed part-time had the least (Lawrence & Wozniak, 1987; Peters & Haldeman,

1987). Children from single-parent homes were also found to spend significantly more time helping around the house than children from two-parent families (Peters and Haldeman, 1987). In addition, lower socioeconomic status was associated with a more traditional assignment of household chores (Lackey, 1989).

Measures and Methods

A majority of the developmental studies related to sibling interactions used observational methods. Studies examined interactions between siblings using unstructured observations in the home (Abramovitch, Corter, & Lando, 1979; Abramovitch et al., 1980; Berndt & Bulleit, 1985; Kendrick & Dunn, 1983) and in the laboratory (Lamb, 1978; Lougee et al., 1977). Studies that assessed siblings' early and middle childhood interactions included observations of siblings playing structured games (Brody, Stoneman, & Burke, 1987b; Bryant & Crockenberg, 1980), completing joint tasks (Minnett et al., 1983), naturalistic observations in the home (Baskett, 1984; Blakemore, 1990; Stoneman et al., 1986) and maternal interviews (Stocker et al., 1989). Structured tasks were also formulated to observe social perspective-taking between siblings (Howe & Ross, 1990; Stewart & Marvin, 1984). In addition, some studies observed mother and siblings playing together (Brody, Stoneman, & Burke, 1987a; Bryant & Crockenberg, 1980).

Observational coding systems used in these studies were diverse ranging from previously studied techniques to specific behaviors chosen by the authors. In some studies individual roles were addressed (e.g., teacher, learner, manager, managee) (Lamb, 1978; Stoneman et al., 1986) and in other studies specific positive, negative, and neutral behaviors of each child were examined (Abramovitch et al., 1980; Berndt & Bulleit, 1985; Brody et al., 1987a; Dunn & Kendrick, 1981; Kendrick & Dunn, 1983; Minnett et al., 1983). One study addressed three types of behavior, conflict, control, and cooperation, (Stocker et al., 1989) while another study addressed three other categories, prosocial behavior, imitation, and antagonism (Pepler et al., 1981). In other studies, the interactions between children were assessed such as conflict incidents, joint play incidents, and joint pretend play (Lougee et al., 1977; Munn & Dunn, 1989). Many coding systems have been formulated but there is no evidence to suggest which method is the best. Depending on the behaviors that are important for a researcher's hypothesis, scales are formulated and implemented in research.

Dunn, Stocker, and Plomin (1990) compared the usefulness of maternal interviews, structured and videotaped semi-structured observations, and naturalistic unstructured observations for determining the positive and negative characteristics of the sibling relationship. Correlations

between sibling interactions in the videotaped session and mother's reports of positive and negative aspects of the sibling relationship were often low but significant. Unstructured observations showed fewer significant correlations with maternal interview measures than did structured observations. Maternal interview responses were found to have the highest test-retest reliability while video-taped, semi-structured sessions had moderate levels of agreement. Naturalistic observations were the least reliable over time (test-retest reliability) and showed few negative aspects of the siblings relationship such as conflict. Low levels of interaction between siblings were also found in a laboratory setting (Lamb, 1978). Few studies included these different methodologies (interviews, structured and unstructured observations), even though, each type of methodology gives a somewhat different view of the sibling relationship (Dunn et al., 1990; Stocker et al., 1989).

Self-report measures formulated to address the sibling relationship include the Sibling Inventory of Differential Experience (SIDE) and the Sibling Relationship Questionnaire (SRQ) (Daniels & Plomin, 1985; Furman and Buhrmester, 1985). The SIDE was formulated to assess relevant differences among siblings on specific characteristics (Daniels & Plomin, 1985). This measure was used for adolescents and young adults to retrospectively describe their sibling

relationships. Items were taken from past questionnaires related to between-family influences and were revised to assess sibling's perception of their relative experience in the family. Fifty questions were formulated and then pilot tested with 50 university students. From these results items were added and eliminated and the measure now contains 73 items. Items were answered using a 5-point Likert scale. These items are categorized into four domains: differential sibling interaction; differential parental treatment; differential peer characteristics; and events specific to the individual. Correlations between the categories were low to moderate (.10 to .54, $p<.05$). Results from separate principal component factor analyses for three of the four categories (excluding events specific to the individual) elicited four factors for differential sibling interaction (antagonism, caretaking, jealousy, and closeness), two factors for differential parental treatment (attention and control), and three factors for differential peer characteristics (orientation toward college, popularity, and delinquency). The SIDE had high test-retest reliability (ranging from .77 to .93) when administered approximately two weeks apart. However, agreement between siblings (inter-rater agreement) was found to be low to moderate in a sample of 149 sibling pairs (Daniels & Plomin, 1985).

Furman and Buhrmester (1985) developed the Sibling Relationship Questionnaire (SRQ) to examine sibling

perceptions of the quality of their relationship. Items were obtained through interviews with children using open-ended questions about their sibling interactions. Scales include: intimacy, prosocial behavior, companionship, similarity, nurturance, admiration, domination, quarreling, antagonism, competition, parental partiality, and satisfaction. Test-retest reliability was high for these scales, mean r=.71 (ranging from .58 to .86), when administered ten days apart. A principle component analysis of all the items extracted four factors: warmth/closeness, relative status/power, conflict, and rivalry. The four factors were minimally correlated with each other (r's= -.08 to -.16), except for conflict and rivalry which were moderately associated (r=.35).

In summary, the method of data collection for most developmental research studies on sibling interactions has been observations in structured or semi-structured environments. Fewer researchers have utilized self-report or parent-report measures. Most observational studies have been well-controlled but involved few subjects. This is understandable as most observational studies require a substantial contribution from subjects, often including videotaping. Most studies examined first- and second-born siblings and families in a narrow range of socioeconomic status. No study observed the interactions between more than two siblings. When performing this type of research,

samples have been demographically homogeneous to permit better detection of effects associated with the specific study variables of interest. Consequently, study findings are often less generalizable to the entire population. For example, two parent families have been the primary target of the research; single parent families may exhibit very different results. Researchers must walk a fine line between the generalizability and preciseness of their research.

In contrast to studies of sibling interactions, sibling participation in household tasks have been primarily assessed by self-report measures including time diaries (Peters & Haldeman, 1987; Sanik, 1981) and interviews (Blair, 1992; Goodnow & Delaney, 1989; Goodnow et al., 1991; Lawrence & Wozniak, 1987; McHale, Bartko, Crouter, & Perry-Jenkins, 1990; White & Brinkerhoff; 1981a). The time diaries provide space for family members to write the amount of household activities performed over a 24-four-hour period using predefined categories (i.e., food preparation, dishwashing, shopping, housecleaning, maintenance, care of clothing, construction of clothing, physical care of other family members, nonphysical care of family members, and management)[Peters & Haldeman, 1987; Sanik, 1981]. In the Peters and Haldeman (1987) study, mothers (all homemakers) completed the diary for all members of the family who were above the age of 6 years. Mothers completed the diaries

about two days, the current day and the preceding day. There was no mention in the study if one of the recorded days was a weekend and one was a weekday, as different chores may be performed during specific days of the week. Additionally, two days may not be representative of typical, weekly household responsibilities. This method also requires a high level of motivation by participants to ensure accurate completion of the forms.

McHale et al. (1990) used cued-recall interviews to collect data over the phone about parent and child household responsibilities. Family members were given an activity list of twelve household chores and were asked how many minutes they performed each activity and who participated in the activity (e.g., mother, sibling, friend). Telephone interviews were done approximately one hour before the child's bedtime and the child was asked about that day's chores. The interviews were completed over a three week period and entailed seven phone calls, five weekdays and two weekends. Test-retest reliability was performed by asking the participants the same questions twice during an interview; $r=.90$ to .99, $p<.01$.

Goodnow and Delaney's (1989) interview used a semi-structured format, separating tasks into two categories, self care and family care. The use of specific categories (e.g., chores child does for self and chores child does for others) may help parents remember more tasks. Other studies

did not organize responsibilities into categories, focusing on specific tasks such as meal preparation, dishes, cleaning, ironing and washing, shopping, auto maintenance, outdoor tasks, and bills (Blair, 1992).

The most comprehensive list of household responsibilities was used in the handicapped literature (Stoneman, Brody, Davis & Crapps, 1988; Stoneman, Brody, Davis, Crapps, & Malone, 1991). In addition to asking about household responsibilities, investigators also addressed child care responsibilities, an area that has been overlooked in many research endeavors. This format could be improved if responsibilities were categorized and questions were used to probe parents about other responsibilities that their children performed. The categories would make inquiry easier and probes may elicit other chores that were not considered in the development of the questionnaire.

Handicap and Chronic Illness Literature

The research on siblings of children with a chronic illness or handicap is limited. The psychological and behavioral outcome of these siblings has been the focus of most researchers. The handicap literature has addressed the sibling relationship and roles in the family to some extent but this has been completely ignored in the chronic illness literature.

Psychological Outcome

Children with a handicap or chronic illness often have special needs that require more attention and time than the needs of their healthy siblings. This may place high demands on parents, stress on the family system, and have negative implications for siblings (Lobato, Faust, & Spirito, 1988). Siblings of children with a chronic illness reported having worries and concerns about the health of their brother or sister (Chesler, Allswede, Barbarin, 1992; Menke, 1987). Some research indicated that siblings of children with a chronic illness or handicap have a higher risk of behavior problems and adjustment difficulties (Breslau, 1983; Lavigne & Ryan, 1979; Lobato, Barbour, Hall, & Miller, 1987). Parents of children with a hematologic disorder, cardiac problem, or facial deformity were more likely to report irritability and social withdrawal in their healthy child than parents of children who had no medical condition (Lavigne & Ryan, 1979). Siblings of children with handicaps were significantly more aggressive and anxious than their peers on standardized parent-report measures (Breslau, 1983; Lobato et al., 1987). In addition, female siblings of children who were mentally deficient reported higher levels of antisocial behavior than male siblings of children who were mentally deficient or controls who did not have a sibling with a mental deficiency (Gath, 1973). Siblings of children with handicaps were also rated by their

mothers as having less participation in athletics and other social activities compared to siblings of nonhandicapped children (Dyson, 1989).

Other studies showed no differences between the sibling's functioning and the disease or handicap status of other children in the home. Researchers found no significant difference between parents' report of behavior problems in siblings of children with a chronic illness or siblings of healthy controls (Cadman, Boyle, & Offord, 1988; Ferrari, 1984; Sawyer, Crettenden, & Toogood, 1986). No greater signs of social withdrawal or decreased involvement in leisure activities were reported for siblings of children with a chronic illness compared to a control group of healthy children (Cadman et al., 1988). In addition, no difference was found in aggressiveness between siblings of children with a chronic illness and healthy controls (Lavigne & Ryan, 1979). Parents also reported that siblings of children with a handicap had similar levels of self-concept, behavior problems, and social competence compared to siblings of children with no handicap (Breslau, Weitzman, & Messenger, 1981; Dyson, 1989). Gath (1972) found similar results for siblings of children with Down's Syndrome. Family members of children who are developmentally disabled perceived the child's disability as having little effect on the family (Dunlap & Hollinsworth, 1977). In addition, when siblings of children who were institutionalized for severe

retardation were compared to siblings of children with severe retardation who resided in the home, there was no reported difference in emotional adjustment (Caldwell & Guze, 1960). Teenagers reported few negative personal effects resulting from living with a sibling who had a severe mental deficiency (Graliker, Fishler, & Koch, 1962). Benefits have also been noted such as fewer problem behaviors of male siblings of children with a handicap compared to siblings of children with no handicap (Dyson, 1989).

Mixed results were also found concerning the relationship of sibling's self-esteem and the disease or handicap status of other children in the home (Bagenholm & Gillberg, 1991; Cairns, Clark, Smith, & Lansky, 1979; Ferrari, 1987; Harvey & Greenway, 1984; McHale & Gamble, 1989). Siblings of children with a physical handicap or diabetes (regardless of gender) reported lower self-esteem compared to controls who had healthy siblings (Ferrari, 1987; Harvey & Greenway, 1984). Ferrari (1987) found that the younger brothers of a child with diabetes had lower self-esteem than younger sisters. Another study found that female, but not male, siblings of children with a handicap had lower self-esteem compared to controls (McHale & Gamble, 1989). No differences in self-esteem were found between the siblings of children with a mental deficiency, children with autism, or healthy controls (Bagenholm & Gillberg, 1991).

Cairns et al. (1979) also found no evidence that siblings of children with cancer had low self-esteem; however, their methodology was flawed as there was no healthy control group for comparison.

Contradictory results were also found for teacher ratings of behavior and achievement in siblings of children with a chronic illness. In one study, teachers indicated that the frequency of maladjustment among siblings of children with spina bifida was four times greater than that of siblings of normal controls (Tew & Laurence, 1973). Teacher ratings of siblings of children with nephrotic syndrome indicated that a higher proportion of these siblings were underachieving compared to their peers (20.7% versus 9.4%) but also a higher proportion of them were over achieving compared to their peers (9.4% versus 0%) (Vance, Satterwhite, & Pless, 1980). Other studies found no significant increase in the amount of learning or academic difficulties in siblings of children with a chronic illness, handicap, or physical deformity (Cadman et al., 1988; Lavigne and Ryan, 1979; Mates, 1990).

Gender by birth order effects have been established in relation to psychological outcome of siblings of children with a handicap. Breslau et al. (1981) and Breslau (1982) found that younger male siblings and older female siblings of children with a handicap were the most at risk for psychological difficulties. Consistent with this, Gath

(1974) found that older sisters, approximately three years older than their sibling with a mental deficiency, had the greatest risk of maladjustment. When adjustment difficulties were present, girls often had depressive anxious feelings while boys were more prone to aggression (Breslau, 1982). Furthermore, greater involvement in activities of the child with a disability were correlated with higher levels of depression and anxiety for older siblings (McHale & Pawletko, 1992). In addition, age spacing was found to have a significant effect on sibling adjustment. Siblings of children with a handicap had better adjustment the larger the age spacing between the siblings (Dyson, 1989).

In three studies, other demographic variables such as age, parental education, socioeconomic status, married versus single family status explained little or none of the variance in psychological functioning of siblings of children with a chronic illness (Daniels, Miller III, Billings, & Moos, 1986; Ferrari, 1984; Schwirian, 1977).

Studies of the severity of a child's handicap on sibling adjustment have yielded contradictory results. In two studies, severity or the life threatening nature of disease was not correlated with amount of behavior problems in siblings (Breslau et al., 1981; Lavigne & Ryan, 1979). In contrast, Tew and Laurence (1973) found that siblings of children with less severe handicaps had higher behavioral

maladjustment in school than those with more severe handicaps.

Several studies suggested that visibility of disease may be a more important predictor of sibling adjustment than severity of disease. Dyson (1989) found that siblings of children with a mental deficiency showed fewer adjustment difficulties than siblings of children with physical or sensory handicaps. Siblings of children with a visible handicap were also found to be significantly more withdrawn than siblings of children with an invisible illness (Lavigne & Ryan, 1979). Consistent with this, siblings of children with a congenital heart disease had better psychological adjustment than those with facial burns (Goldberg, 1974).

Family risk factors appeared to further contribute to sibling psychological well being or distress. Daniels, Moos, Billings, and Miller III (1987) reported that higher family cohesion and expressiveness with lower family conflict was associated with better functioning in siblings of children with a chronic illness. Findings also indicated that mothers' depressed mood and increased symptomatology were negatively related to the functioning of siblings of children with a chronic illness. Similar but not as significant findings were established for control families with physically healthy children.

The Sibling Relationship

The effect on the sibling relationship of differential treatment of siblings by their mothers was studied using dyads where the younger child had a disability and dyads without any disabilities (McHale & Pawletko, 1992). Differential treatment was addressed in reference to time spent in joint activity with mother, type and amount of maternal discipline, and household responsibilities. Outcome was measured by older siblings self-report of their sibling relationship and their psychological adjustment. Mothers who exhibited more positive love (e.g., reflecting on the child's feelings, explaining how their sibling feels, reasoning with child, and mediating between siblings) toward their older child than their younger child who had a disability had older children who reported a more positive sibling relationship but a more negative psychological adjustment. In contrast, more positive maternal attention directed toward an older child in families where siblings are both healthy was associated with a poorer sibling relationship but better psychological adjustment of the older child. Another study found that the quality of the sibling relationship was similar when one child had a handicap or both children had no handicaps (McHale, Sloan, & Simeonsson, 1986).

Role relations between older children and their younger same-sex siblings with mental retardation, as well as older

children with mental retardation and their same-sex younger siblings were addressed by Stoneman and colleagues (Stoneman, Brody, Davis, & Crapps, 1987, 1989; Stoneman et al., 1991). These children were compared to sibling pairs without a mental deficiency who were matched on age, gender, and family characteristics. Children were observed at home, two times, approximately a week a part. Behavior codes in the studies included teacher, helper, manager, playmate, interactor, solitary, positive and negative affect, and comply. Only in the Stoneman et al. (1987) study were children observed in the home with no disruption of normal family activities and with parents present. In this study, boys and girls with a younger sibling who was mentally deficient most often chose to play with toys or engaged in noncompetitive physical play, respectively, while the comparison group of brothers and sisters most often watched television or played games. The other studies observed interactions between the two siblings in three activities (toy play, snack time, and television watching) which were set by the authors (Stoneman et al., 1989, 1991). Older siblings in both the mentally deficient group and comparison group did not differ in affective quality of interactions with their younger siblings, even though younger siblings with mental retardation were more likely to exhibit negative behaviors toward their siblings (Stoneman et al., 1989). However, older siblings were more likely to emit managing,

helping, and teaching behaviors and greater role asymmetries were found when the younger sibling had a mental deficiency (Stoneman et al., 1987, 1989). More adaptive skills of the sibling who was mentally retarded was associated with greater interactions between siblings (Stoneman et al., 1987; 1989; 1991). Older sisters were the most likely group to assume the role of teacher, especially when their younger sibling was mentally deficient. Older girls received the same amount of maternal attention whether or not their younger sister had a mental deficiency, while older boys with a sibling who was mentally deficient received more attention than the comparison group of older boys (Stoneman et al., 1987). Although overall interaction with fathers was low, older girls with a sibling who was mentally retarded interacted with their fathers significantly less than older comparison girls (Stoneman et al., 1987).

Typically, older siblings have a more dominant role in sibling interactions. However, younger siblings of children with mental retardation exhibited more dominant roles than the older child (Stoneman et al., 1991). Behavior of younger siblings of children with a mental deficiency was not associated with gender. Thus, male and female younger siblings both had the same responsibilities of teaching or helping their older sibling with a handicap. In contrast, older female siblings of youngsters who were mentally

deficient were more likely to exhibit these behaviors than older male siblings.

Household Responsibilities

Most children, even when there is no illness or handicap in the family, have specific household responsibilities. Siblings of children who are disabled typically spend a greater amount of time performing chores than other siblings (McHale & Pawletko, 1992). Sisters of children with a handicap spend the greatest amount of time involved in caretaking responsibilities compared to brothers of children with a handicap (Lobato et al., 1987; Mchale & Gamble, 1989). Lobato et al. (1987) found that brothers of a child who was handicapped tended to have a greater number of privileges and less restrictions than sisters of a child who was handicapped who had a higher number of demands and expectations placed on them by their parents.

Possible role changes in the family specific to child care and household responsibilities as a result of one child having a mental deficiency were addressed by Stoneman and her colleagues (Stoneman et al., 1988, 1991). Role asymmetries between same-sex sibling pairs were examined for pairs with an older child who was mentally deficient (Stoneman et al., 1991) and for pairs with a younger child who was mentally deficient (Stoneman et al., 1988). As in their previous studies, a healthy matched comparison group was also studied and compared with these groups. Data were

collected from maternal and sibling interviews as well as by direct observation. The structured interview given to the mother and younger sibling was adapted from Schwirian's (1976) interview and assessed child care responsibilities, household chores, contacts with friends, and extracurricular activities. Child care responsibilities included babysitting, sibling monitoring, and helping with daily physical care. The extent of responsibility for household tasks was determined by asking about personal and self-care tasks (e.g., making one's bed and hanging up clothes), meal preparation (e.g., shopping, cooking, and setting table), cleaning house (e.g., dusting, vacuuming, and picking up toys), and outside tasks and yardwork (e.g., washing the car, mowing the lawn, and gardening). Information was also requested about how much time the sibling who was not mentally deficient spent performing household responsibilities compared to other children their age. Peer contact and extracurricular activities included frequency of visits to peers' homes and frequency of specific activities. In addition, sibling interactions were observed for a more direct view of sibling roles.

Younger siblings of an older mentally deficient child had more child care responsibilities but less household responsibilities than a same-age comparison group. However, when there was an older female sibling in the home without mental retardation as well as a middle sibling with mental

retardation, the younger sibling's child care responsibilities were significantly reduced for babysitting and monitoring. There was no evidence that the extra burden of child care had a detrimental effect on the social activities of the younger sibling of a child who was mentally deficient.

Older sisters of children with a mental deficiency had the greatest caretaking responsibilities. However, brothers of younger boys with a mental deficiency babysat significantly more than the comparison group of older sisters or brothers. There was no significant relationship between amount or type of household chores and sibling's handicap status. Household chores were significantly related to gender, following typical sex-role patterns where boys were more responsible for yard work and girls more responsible for self-care tasks (e.g., making one's bed, hanging up own clothes, and meal preparation). Similar to the previous study, no difference was found for the quality of peer relationships for older siblings of a child with a mental deficiency. Brothers of a child with a mental deficiency actually spent the most time with friends. For siblings of children with a mental deficiency, childcare responsibilities were positively related to sibling conflict and household responsibilities were negatively related to sibling conflict.

In the handicapped and chronic illness literature, socioeconomic status may have larger effects than was found in the literature addressing healthy children's sibling relationships. Farber (1960) found that mothers with low socioeconomic status reacted to the birth of a newborn who was severely mentally retarded with concerns about the increased daily needs of the child and the limited resources of the family. On the other hand, higher socioeconomic families described their sadness about the newborn being unable to meet their preconceived exceptions and aspirations. This may indirectly effect the siblings of these children as upper class families may have extremely high expectations for the healthy siblings and lower class families may require healthy siblings to take on more household and caretaking responsibilities. Consistent with this, Gath (1974) found that lower class female siblings spent the greatest amount of time caring for children who were mentally deficient.

Insulin-Dependent Diabetes Mellitus (IDDM)

Few studies have examined siblings of children who have insulin-dependent diabetes mellitus (IDDM). Psychological outcome of siblings of children with diabetes was examined in two studies (Ferrari, 1987; Crain, Sussman, & Weil, 1966). Ferrari (1987) found that siblings of children with diabetes have lower self concepts than peers. Gender composition was also correlated with self concept; brothers

of male children who had diabetes reported the lowest self concept of all sibling groups (Ferrari, 1987). In contrast, Crain et al. (1966) found no significant difference between the self-esteem of children with diabetes and same age siblings of children with diabetes but no healthy comparison group was used in this study. With contradictory findings no conclusions can be made about the effect of a child's disease status on the psychological functioning of their siblings.

Most research has focused on the functioning of the child with diabetes. Two main areas have been examined: adherence and metabolic control. Children with IDDM have a daily regimen that includes diet, exercise, insulin injections, and blood glucose testing. The severity of their illness or level of metabolic control is often assessed in research by glycosolated hemoglobin assay (HbA1C), an index of average blood glucose levels over the past three to four months (Chase, 1995).

Research has established specific family variables related to metabolic control of children with insulin-dependent diabetes (Anderson, Miller, Auslander, & Santiago, 1981; Delbridge, 1975; Hanson, Henggeler, Harris, Burghen, & Moore, 1989). Children from maladjusted families were found to be in poorer metabolic control than children from more adjusted families (Delbridge, 1975). Family variables such as high conflict, high rigidity, and high enmeshment were

also associated with poorer metabolic control (Anderson et al., 1981; Hanson et al., 1989).

One study specifically examined the effects siblings have on the metabolic control of children with diabetes (Hanson, Henggeler, Harris, Cigrang, Schinkel, Rodrigue, & Klesges, 1992). Results indicated that IDDM children with older siblings had better adjustment to diabetes than IDDM children with younger siblings. In addition, high sibling conflict was related to poorer psychological outcome for the child with diabetes. This study suggested that the sibling relationship may influence the IDDM child's psychological adjustment.

Research is needed that focuses on how childhood chronic illness or disability effects the sibling relationship and sibling functioning. A description of siblings roles in families where one child has diabetes would be a good starting point. Hanson et al. (1992) found that IDDM children with older siblings were in better diabetic control. One explanation is that older siblings take on more responsibility for the care of their siblings than younger siblings and thus, help them to be more adherent to their diabetes regimen. Another is that older siblings take on more of the household responsibilities leaving their parent more time to care for their younger sibling with IDDM. Or perhaps older children with IDDM are given less time and attention by their parents when there is

a younger child placing demands on the parents. More research is needed to provide parents and practitioners with a better understanding of how sibling's roles change in the family based on the disease status of the other children in the home.

Summary

The most extensive study of sibling roles can be found in the developmental literature. A strong association has been established between sibling roles and gender, age, and birth order. Gender was found to be the best predictor of the amount of household chores a child performs, with females involved in the most household labor. Gender was also strongly related to sibling's sex role attitudes and stereotypes. In addition, age and/or birth order were found to be positively related to the perceived power the child has in the sibling relationship and the amount of household responsibilities the child performs. Gender by age effects showed that female, older siblings were the most nurturant and tended to have more child care responsibilities compared to other siblings.

The developmental literature has also examined the quality of the sibling relationship and sibling interactions. The research on the sibling relationship and sibling interactions has most often used observational methods, while the research on household responsibilities has most often used structured interviews. Data collected

about sibling interactions had the highest test-retest reliability using maternal interviews, was moderately reliable using semi-structured observations, and was the least reliable over time using naturalistic observations. The developmental literature has focused on the normal, physically healthy child but could be used as a framework for further research concerning siblings of children with a handicap or chronic illness.

The chronic illness and handicap literature is sparse, with most studies addressing the psychological or behavioral outcome of the sibling. This information was primarily obtained through maternal self-report. The research of Stoneman and her colleagues (1988, 1991) is of particular interest because they examined the household responsibilities of siblings of children who were mentally deficient. They formulated a scale that incorporated past developmental research on children's household responsibilities. Further research is needed to focus on the sibling roles in families where one child has a chronic illness.

The research on siblings of children with diabetes has focused on the psychological outcome of the well sibling. There was no published studies examining childrens' household responsibilities in families where one child has diabetes. The present study will broaden our understanding of the impact of childhood diabetes on sibling roles.

Similar to Stoneman's work, this study will focus on siblings' household responsibilities and peer relationships.

CHAPTER 3

SPECIFIC AIMS AND HYPOTHESES

The purpose of this study was to assess whether first-born siblings of children with insulin-dependent diabetes have more household and child care responsibilities than their peers. This study describes the amount and type of household responsibilities performed by first-born siblings based on their gender, birth order, age, and their younger sibling's health status (with or without diabetes). Second-born siblings' responsibilities were also explored. The effects of gender, birth order, age, and disease status on the quantity of outside of home activities were also examined.

The reports of two respondents, the parent and first-born child, were used. Each participant was asked to describe the household responsibilities and outside of home activities of both first- and second-born children. The main hypotheses were as follows:

1. Respondent effects. First-borns will report a greater discrepancy between their responsibilities and those of their younger siblings than will parents. No research to date has addressed this. However, this may be a result of first-born children exaggerating the amount

of household work they perform in contrast to their younger sibling.

2. Health status effects. (a). First-born siblings of children with diabetes will have more responsibilities than first-born siblings of healthy youngsters. Hanson et al. (1992) found that children with diabetes who have an older sibling are in better control. One possible explanation is that an older sibling may take some responsibility for the care of a child with diabetes, helping the child to be more adherent to the diabetes regimen. Or perhaps, an older sibling takes on more household responsibilities, leaving the parents more time to care for the child with diabetes. (b). Second-borns with diabetes will have less household responsibilities than second-borns without diabetes. No research to date has addressed this hypotheses. Parents may be reluctant to assign the child with diabetes additional household chores in addition to their extensive, daily, medical regimen.

3. Age effects. Age will be significantly related to amount of household responsibilities. Older siblings will have more responsibilities than younger siblings, regardless of birth order. Numerous studies have shown a positive association between age and household responsibilities in healthy children (Cogle & Tasker, 1981; Lawrence & Wozniak, 1987; White & Brinkerhoff,

1981b). Daniels & Plomin (1985) also found that older siblings perform more caretaking responsibilities than their younger siblings.

4. Birth order effects. First-born siblings will have more household responsibilities than second-born siblings, regardless of age. Past research has shown that first-born siblings have the dominant role in the sibling relationship and frequently exhibit teaching or managing behaviors directed toward their younger siblings (Brody et al, 1982; Stoneman et al., 1984). More household chores, including responsibilities for their younger sibling, are probably expected from this older, more dominant sibling.

5. Gender effects. Gender will be significantly related to amount of household responsibilities. Female siblings will perform more household responsibilities. Studies have found gender to be the greatest predictor of the amount of chores performed in the household (Blair, 1992; Lawrence & Wozniak, 1987). First-born females will perform the most sibling care. Older female siblings of children with a mental deficiency have been shown to perform the most babysitting responsibilities (Stoneman et al., 1988).

7. Gender by health status effects. (a). First-born female siblings of children with diabetes will perform the most household responsibilities. Research has shown

that older, female siblings of children with a mental deficiency perform more child care responsibilities compared to peers (Stoneman et al., 1986). (b). First-born male siblings of children with diabetes will have more child care responsibilities than peers but not more family and self care responsibilities. Similar results were found for older brothers of children with a mental deficiency (Stoneman et al., 1988). (c). First-born male siblings of children with diabetes will have more peer activities than older female children with a sibling who has diabetes or male peers. In one study, older brothers of a child with a mental deficiency spent the most time outside the home with friends compared to other older siblings (Stoneman et al., 1988).

CHAPTER 4

DESIGN

A repeated measures design was used, with each family treated as an individual subject. Within subjects variables included respondent (parent and first-born sibling) and birth status (first-born and second-born). Between subjects variables included health status of younger sibling (diabetes and healthy), first-born's age (younger group: 8-12 years and older group: 13-16 years) and gender, and second-born's age (younger group: 5-9 years and older group: 10-15 years) and gender. There were five dependent variables: total chore score, three category scores (sibling care, self care, and family care) and an activity score.

For each dependent variable, three separate repeated measures ANOVAs (a comparison of first- and second-borns, first-borns separately, and second-borns separately) were employed. In the first-born/second-born comparison model (Figure 1), respondent and birth status were the within subjects variables and health status of the younger sibling was the between subjects variable. Gender and age of first-born and second-born were not included because each family was comprised of sibling pairs of varied age and gender compositions which were not controlled for in the study.

Therefore, age and gender could not be included in the analyses in a meaningful way. Because of the inability to examine age and gender effects in the first-born/second-born comparison model, separate models (Figure 2) for the first-borns and second-borns were required. In these models, the between subjects variables were the child's age and gender and the health status of the younger sibling and the within subjects variable was the respondent.

Between Subjects Variables

* YOUNGER SIBLING'S HEALTH STATUS	DIABETES	HEALTHY

Within Subjects Variables

RESPONDENT	PARENT		FIRST-BORN	
CHILD (BIRTH ORDER)	FIRST	SECOND	FIRST	SECOND

FIGURE 1
FIRST- AND SECOND-BORN COMPARISON MODEL

First-born Model

Between Subjects Variables

AGE OF CHILD	8-12				13-16			
GENDER OF CHILD	MALE		FEMALE		MALE		FEMALE	
*YOUNGER SIBLING'S HEALTH STATUS	D	W	D	W	D	W	D	W

* D=diabetes; W=well/no chronic illness

Within Subjects Variables

RESPONDENT	PARENT	FIRST-BORN

Second-born Model

Between Subjects Variables

AGE OF CHILD	5-9				10-15			
GENDER OF CHILD	MALE		FEMALE		MALE		FEMALE	
*YOUNGER SIBLING'S HEALTH STATUS	D	W	D	W	D	W	D	W

* D=diabetes; W=well/no chronic illness

Within Subjects Variables

RESPONDENT	PARENT	FIRST-BORN

FIGURE 2

SEPARATE MODELS FOR FIRST- AND SECOND-BORNS

CHAPTER 5

PROCEDURE AND METHODS

Subjects

Ninety-six sibling pairs were recruited for this study. Six families declined participation. Older siblings were between 8 and 16 years old and younger siblings were between 5 and 15 years old. The oldest child in the home and the second oldest child in the home were the target children. The oldest children were first-borns, with the exception of two families whose first-born children had resided outside of the home for more than one year. For this study, the second-borns in these families were considered to be first-borns and the third-borns were considered to be second-borns. Fifty-two percent of first-borns were male and forty-eight percent of first-borns were female. Half of the second-borns had insulin-dependent diabetes for greater than one year and the other half were healthy. Table 1 provides demographic information for both the diabetes group and the control group. The children with diabetes had few hospitalizations and school absences related to their diabetes in the preceding year and were diagnosed with diabetes for an average of 2 years (Table 2). Families were excluded from the study if the child with diabetes was not

the second oldest child in the home or if any other sibling had a chronic illness. Four families who had a parent with a chronic illness (two in the diabetes group and two in the control group) participated in the study. These parents worked full-time and felt that their illness did not impact on their daily functioning or parental role.

Measures

Structured Interview

The interview was adapted from Stoneman et al.'s (1988; 1991) structured interview of household responsibilities. Their measure proved to have high test-retest reliability for mothers (.89 to .98) and older siblings (.79 to .94) when administered one week apart. Mother/sibling agreement ranged from .47 to .71.

In the revised interview used in the present study, household responsibilities were grouped into three categories: sibling care (e.g., babysits sibling when parents are not at home, helps sibling with homework), self care (e.g., makes own bed, cleans bedroom), and family care (cooks meals for family, vacuums, washes the car). These categories were formulated by Goodnow and Delaney (1989) while specific items were primarily drawn from the structured interview by Stoneman. Additional items were generated in all three categories (e.g., sibling care items: caring for an ill sibling and helping their sibling with homework; self care items: washing own clothes and cleaning

own room; and family care items: shopping for food for household and watering houseplants). Information as to whether the child does family tasks alone or with help of other family members (parent or sibling) was collected. The interviewer probed about other tasks the child might perform that fit into the three specific categories. Also, respondents were asked their perceptions (more, less, or the same) about the amount of chores and outside of home activities each child performed compared to peers.

Demographic Questionnaire

The Demographic Questionnaire was designed to assess relevant information about the family, including who was living in the home, whether or not any family member had a chronic illness, the age and gender of the children living in the home, and the race of the children. The education level and occupation of each parent was also included in order to determine socioeconomic status by the Hollingshead Four Factor Index of Social Status (1975).

Health Status Questionnaire

The Health Status form was designed to assess the severity of the illness of the child with diabetes. It included information about number of hospitalizations, absences from school, and date of diagnosis.

Interviewer Training

Five undergraduate research assistants were trained to administer the interview. The interview was role-played between the research assistants and the principal investigator and practice families were used to gain proficiency in administering the interview. In addition, research assistants were tested using a practice script that gave the number and type of household tasks two siblings performed a week. They attained a 98% to 100% proficiency before they administered the interview to study participants.

Procedures

Families with children who have diabetes were recruited through the diabetes summer camp, diabetes clinic at Children's Medical Services in Gainesville, Florida and the diabetes clinic at Nemours Hospital in Jacksonville, Florida. Parents were either approached in person during a clinic visit, at camp registration, or were contacted by telephone for participation in this study. Parents signed a consent form or gave verbal consent over the telephone. The study protocol was explained to the parents and older children, including their eligibility for free medical supplies and a $50 raffle.

The subjects for the control group were sought through a local school, PK Yonge Developmental Research School. The study was explained to the students during one of their

academic classes, including their eligibility for a $50 raffle. Children between 8-16 years old were asked specific questions in a group format in their classroom to see if they fit the study criteria. Children who did not have a chronic illness and had a younger brother or sister who was also healthy were asked to participate. Those who agreed were given consent forms to bring home to their parents. If their parents signed the consent form, the children were asked to return this form to their classroom teacher. Parents of the children who forgot to return this form were called, the study was explained to them, and they were asked to give verbal consent if they wanted to participate.

Once consent was obtained, both the parent and the older sibling were interviewed by telephone. The parents and first-borns were given the structured interview for the household responsibilities and peer activities (see Appendix A). Each was interviewed separately about the first-born sibling and the second-born sibling in the home. The parents were also given the demographic questionnaire (see Appendix B) and if they were in the diabetes group, the health status form (see Appendix C). This was done orally if interviewing the parent over the phone or in writing if the parent was approached in person. Interviews took approximately one hour per household. All interviews were taped, with permission of the participants. However, there

were technical problems with the equipment and about 30% of the tapes were inaudible.

The interview yielded the number of hours per week a child spent performing specific chores and activities in the last month. Four household responsibility scores were derived from the interview: sibling care, self care, family care, and total (sibling care + self care + family care). A fifth score measured the amount of time each child spent in outside of home activities.

Thirty siblings and their parents were asked to repeat the study to determine test-retest reliability. For these subjects, the interview was performed again, within one week of the original interview. Participants were randomly chosen throughout the entire study.

To determine inter-rater reliability, thirty of the taped interviews were randomly selected and recoded by the principal investigator or a research assistant.

TABLE 1

DEMOGRAPHICS

	TOTAL SAMPLE (n=96)	DIABETES GROUP (n=48)	CONTROL GROUP (n=48)
PARENT WHO RESPONDED			
Mother	88	43	45
Father	6	4	2
Grandparent	2	1	1
# OF CHILDREN IN HOME (M=2.3)			
2	71	37	34
3	21	10	11
4	3	0	3
7	1	1	0
OLDEST CHILD'S SEX			
Male	49	25	24
Female	47	23	24
OLDEST CHILD'S AGE (M=12.5)			
8	3	1	2
9	5	3	2
10	14	7	7
11	15	7	8
12	11	6	5
13	12	8	4
14	12	6	6
15	12	4	8
16	12	6	6
YOUNGER CHILD'S SEX			
Male	42	18	24
Female	54	30	24
YOUNGER CHILD'S AGE (M=9.3)			
5	5	2	3
6	7	5	2
7	8	3	5
8	19	7	12
9	8	5	3
10	15	11	4
11	11	7	4
12	9	1	8
13	11	7	4
14	2	0	2
15	1	0	1

TABLE 1 (Continued)

	TOTAL SAMPLE	DIABETES GROUP	CONTROL GROUP
RESIDE			
Mother and Father	69	36	33
Mother only	10	4	6
Father and Stepmother	2	0	2
Mother and Stepfather	13	7	6
Grandparents	2	1	1
SOCIOECONOMIC STATUS (M=3.8) (Hollingshead)			
1	3	1	2
2	6	2	4
3	26	15	11
4	38	19	19
5	23	11	12
RACE			
White	80	41	39
Minority	16	7	9
African-American	8	1	7
Hispanic	4	4	0
Native American	1	1	0
Biracial	3	1	2
EMPLOYMENT STATUS			
Father/Grandfather			
Full-time	82	44	38
Part-time	2	1	1
Unemployed	2	0	2
Mother/Grandmother			
Full-time	64	27	37
Part-time	8	3	5
Unemployed	24	18	6

TABLE 2

DIABETES GROUP INFORMATION

	FREQUENCY	PERCENT
# OF DAYS IN HOSPITAL* (M=.39)		
0	37	77.1
1	7	14.6
3	2	4.2
10	1	2.1
14	1	2.1
# OF SCHOOL DAYS ABSENT* (M=.80)		
0	24	50.0
1	5	10.4
2	3	6.3
3	7	14.6
4	3	6.3
5	4	8.3
6	1	2.1
7	1	2.1
# OF YEARS WITH IDDM (M=2.09)		
1	9	18.8
2	5	10.4
3	11	22.9
4	5	10.4
5	2	4.2
6	7	14.6
7	5	10.4
9	1	2.1
10	1	2.1
11	1	2.1
12	1	2.1

* Diabetes related incidents in the past year.

CHAPTER SIX

RESULTS

Reliability

Inter-Rater Reliability

Pearson product moment correlations and dependent t-tests were used to determine interview inter-rater reliability (Table 3). Correlations ranged from .95 to 1.0 ($p < .0001$). There was no significant difference between the scores yielded by the two raters.

Test-Retest Reliability

Pearson correlations ranged from .44 to .98 for interview scores between time one and time two (Table 4). Total household responsibility scores (.68 to .83) and activity scores (.71 to .98) were the most stable when retested within a week. Most scores decreased from time 1 to time 2 (Table 4). However, this change was only significant for parents' ratings of first-borns' performance of sibling care and total household chores.

Parent-Child Agreement

Parent and first-born responses were significantly and positively correlated for all scores, ranging from .26 to .72 (Table 5). The outside of home activity score was the only score that was significantly different by respondent

for perceptions about first-borns ($t=-2.50$, $p=.02$). First-borns reported spending more time in outside of home activities than was reported by their parents.

Parents and first-borns significantly differed on the amount of time they reported that younger siblings spent engaged in self care tasks ($t=3.51$, $p=.001$), total household chores ($t=2.31$, $p=.02$), and outside of home activities ($t=2.40$, $p=.02$). (Later analyses employing log transformations found that sibling care chores were also significantly different based on respondent.) In all cases, parents reported higher scores than were reported by first-borns.

Preliminary Analyses

No significant difference was found between the diabetes group and the control group (using t-tests and chi-square analyses) for age and gender of siblings, number of children in the home, with whom the children were residing, race, and socioeconomic status. Paternal hours of employment was not significantly different between the two groups but maternal hours of employment was significantly different ($t=-3.01$, $p=.003$). Mothers with a child with diabetes worked fewer hours ($M=23$ hours) than mothers with two healthy children ($M=34$).

Preliminary statistics restricted to the diabetes group were also performed to determine if first-borns had younger siblings with similar health characteristics (years since

diagnosis, days hospitalized or absent from school). Male and female first-borns did not significantly differ on the health characteristics of their younger sibling. In addition, preadolescent and adolescent first-borns had younger siblings who had similar health characteristics.

Overview of Analyses

Repeated measures ANOVAs were implemented using SPSS/PC+, Version 4.0 (Microsoft Corporation, 1988). First, comparisons of first- and second-born data were performed separately for each dependent variable (total chore score, the three category scores, and the activity score). Independent variables used were health status of the younger sibling, respondent, and birth order. Reduced models were reported, as variables with nonsignificant effects were removed from the model.

Separate repeated measures ANOVAs were then performed for first- and second-born data. Independent variables used were health status of the younger sibling, age and gender of the child, and respondent.

Preliminary findings indicated significant differences between the diabetes and control groups in hours of maternal employment. Therefore, maternal employment was initially used as a covariate. However, it did not account for a significant amount of the variance and was removed from the models.

Data were analyzed with and without logarithmic transformations. Log transformations were employed to correct for non-normal data distribution. Therefore, results from logarithmic transformations were the most reliable and were primarily used to explain results, unless noted.

Household Responsibilities

Total Chores

Children in this study spent an average of 10.3 hours per week performing chores. There was high variability in the amount of chores children performed. According to an average of parent and child report, children spent as little as 54.9 minutes and as much as 54.5 hours per week performing total chores. Separate means and standard deviations for parent and child report of total hours of work performed by first-borns and second-borns based on their age and gender and the health status of the second-born in the family are displayed in Table 6 and 7, respectively.

Repeated measures ANOVAs were utilized to compare first- and second-borns' performance of total chores (Table 8). Siblings in families where one child had diabetes performed more total chores than siblings who were both healthy. First-borns spent significantly more hours performing total chores than second-borns. They spent an average of 12.5 hours per week while second-borns spent an

average of 8.1 hours per week. A significant interaction was found between health status and birth order. Health status was associated with second-borns' total household responsibilities; t (94)=2.9, p=.004. Second-borns who had diabetes performed an average of 3 hours more work per week than second-borns who were healthy. No significant difference was found between first-borns' performance of total chores based on the health status of their younger sibling; t (94)=.8, p=.4. A significant respondent by birth status interaction was also found. Parents reported that second-borns performed significantly more total chores than was reported by first-borns; t (95)=3.4, p=.01. However, parents and children did not significantly differ in their perception of how much time first-borns spent performing total chores; t (95)=-.3, p=.8.

The reduced-model repeated measures ANOVAs for first-borns' performance of total chores can be found in Table 9. Gender was not included in the reduced model because no significant gender effects were found. Age of first-borns was positively related to the amount of hours first-borns performed total chores. Thirteen- through sixteen-year-old first-borns (M=13.9 hours, SD=8.6) spent significantly more time engaged in total chores compared to eight- to twelve-year-old first-borns (M=11.0 hours,SD=9.1). There was also a significant three-way interaction (health status by age by respondent). In the diabetes group, parents reported that

first-borns in the younger age group (8-12 years old) averaged 2.6 more hours of total chores than they reported about themselves; t (23)=2.3,p=.03. Parents also reported that these children spent an average of 4 more hours engaged in total chores per week than 8-12 year old, first-borns who had healthy siblings; t (46)=1.8,p=.02. Parents of two healthy children were the only respondents to report a significant positive association between age and amount of total chores performed. These parents reported that 13-16 year old first-borns spent an average of 2.1 more hours performing total chores than 8-12 year old first-borns; t (46)=-2.0,p=.01. Even though there were no statistically significant main or interaction effects for gender in the model, an inspection of the means suggests that the interaction between gender, health status, and age warrants attention (see Table 6). In healthy families, adolescent females performed an average of 7 more hours of work per week than adolescent males.

As expected the repeated measures ANOVAs for second-borns (Table 10) confirmed the health status effect reported previously. Second-borns with diabetes did more total chores than their healthy second-born peers. A respondent effect was also confirmed. Parents perceived that second-borns spent more time performing total chores than was reported by first-borns. Child's age (F (1,88)=2.2, p=.1) and gender (F (1,88)=1.1, p=.3) were not significantly

related to performance of total chores for second-borns. Although no significant interaction between age and health status was found, an inspection of the means indicated that 5-9 year olds with diabetes performed an average of 3.6 more hours of total chores than 5-9 year olds who were healthy (Table 7).

These analyses were repeated removing self care tasks related to diabetes (administering insulin shots and monitoring blood sugar level). Without these tasks, health status effects were no longer significantly different in any of the models (see Tables 11 and 12). In the birth order comparison model (Table 11), respondents were now significantly different in their perceptions of second-born siblings' performance of total chores; parents reported that second-born siblings did more work (an average of 20 more minutes per week) than was reported by first-borns. No significant effects remained in the first-born model. A main effect for age was now significant in the second-born model. Age was positively associated with amount of household responsibilities.

Sibling Care

Children in the study spent an average of 2.8 hours per week performing sibling care. Some children were not involved in any sibling care while others performed as much as 20.7 hours of sibling care, when parent and child report was averaged. Separate means and standard deviations for

parent and child report of sibling care performed by first-borns and second-borns based on the age and gender of the child and the health status of the second-born in the family are displayed in Table 13 and 14, respectively.

Repeated measures ANOVAs were used to compare first- and second-born's performance of sibling care (Table 15). Health status did not significantly add to the model and was removed. A significant main effect for birth status was found. First-borns spent a mean of 4.3 hours per week (SD=4.6) in sibling care, while second-borns performed a mean of 1.3 hours per week (SD=2.5). A significant respondent by birth status interaction was also found. Parent report was significantly higher than child report for the amount of sibling care performed by second-borns (t (95)=.52, p=.002). There was no significant difference between respondents perceptions of first-borns' performance of sibling care (t (95)=.2, p=.6).

First-born data, analyzed separately, revealed no main effects but a significant three-way interaction between health status, age, and respondent (Table 16). Eight- to twelve-year-old first-borns in the healthy control group reported that they performed 1.5 more hours of sibling care than was reported by their parents; t (23)=-2.5, p=.02.

Second-born data, analyzed separately, revealed a main effect for gender and for respondent (Table 17). Girls spent a mean of 36 more minutes per week performing sibling

care than boys. Parents perceived second-borns to perform more sibling care than first-borns perceived them to do.

Self Care

Children in this study spent an average of 3.5 hours per week performing self care. According to an average of parent and child report, children did as little as 10 minutes and as much as 15.7 hours of self care per week. Separate means and standard deviations for parent and child report of self care performed by first-borns and second-borns based on the age and gender of the child and the health status of the second-born in the family can be found in Table 18 and 19, respectively.

In the birth order comparison model, significant main effects were found for all three independent variables: health status, birth status, and respondent (Table 20). Youngsters with diabetes in the family performed on average 2.2 more hours of self care than youngsters without diabetes in the family. First-borns performed an average of 3.4 hours per week of self care, while second-borns performed an average of 3.5 hours per week. Parent report (M=3.9 hours,SD= 3.3) was significantly higher than child report (3.0 hours, SD=4.0). There was a significant interaction between health status and birth status. Second-borns with diabetes performed an average of 2.2 more hours of self care compared to their healthy second-born peers; t (94)=4.5, p=>.0001. In the diabetes group, there was no significant

difference between second-borns and first-borns performance of self care; t (47)=-2.3, p=.2. However, healthy first-borns (M=3.1 hours, SD=2.5) performed significantly more self care than healthy second-borns (M=2.4 hours, SD=2.6); t (47)=1.6, p=>.0001. A birth status by respondent effect was also found. First-borns reported that they performed more self care than their second-born siblings; t (95)=-2.7, p=.009. Parents did not perceive a significant difference between first- and second-borns performance of self care; t (95)= .3, p=.7. A three way interaction between health status, birth status, and respondent was also revealed. Only the first-borns who had a healthy sibling perceived that they performed significantly more self care chores than their sibling; t (47)=-4.8, p=>.0001.

Analyses performed separately for first-borns revealed age, gender, and respondent significant main effects (Table 21). Overall, first-borns performed an average of 3.5 hours of self care per week. Adolescent females performed approximately an hour more self care tasks than preadolescent females. Female first-borns spent significantly more time (54 minutes more) performing self care chores than male first-borns. Parents perceived that their eldest child performed more (an average of 30 minutes more) self care than these first-borns reported about themselves. A significant health status by age interaction occurred. Age was positively related to performance of self

care tasks in the control group (t (46)=-2.5, p=.002), but not in the diabetes group (t (46)=-.42, p=.6). In the control group, adolescent (13-16) first-borns performed an average of 1.6 more hours of self care than preadolescent (8-12) first-borns. The preadolescent first-borns in the diabetes group spent significantly more time performing self care chores than the preadolescent first-borns in the control group; t (46)=2.5, p=.05. This was not true for adolescents (13-16); t (46)=-.3, p=.5.

Individual repeated measures ANOVAs for second-borns are displayed in Table 22. Gender was removed from the model because there were no significant gender effects in the full model. As expected, the health status effect reported previously was confirmed. Second-borns who had diabetes performed more self care tasks than healthy second-borns. The self care scores were significantly different based on child's age. Second-borns who were 10- to 15-years-old performed more self care tasks than second-borns who were 5- to 9-years-old. Respondent effects were also confirmed. Parents reported that second-borns performed more self care than was reported by first-borns. This only remained significant for second-borns who were healthy (by parent report t(46)=-3.1, p=.004 and by child report t (46)=-2.1, p=.03).

The analyses for self care was repeated removing tasks related to diabetes care. In the comparison model, a

significant health status main effect remained but no significant interactions were found between health status and respondent or birth status (Table 23). Children still reported that they performed more self care than their second-born siblings; t (95)=-4.7, p=>.0001; and now parents also perceived that first-borns did more self care than second-borns; t (95)= -2.4, p=.02. There were no significant health status effects for first-borns when diabetes self care tasks were excluded from the model (Table 24), but a significant gender by age effect emerged. Adolescent females performed more self care compared to adolescent males; t (45)=-3.2, p=.002; and preadolescent females; t (45)=-3.4, p=.002. In the second-born model, health status remained significant (Table 25). The second-borns with diabetes still performed more self care than healthy, second-borns. However, a health status by respondent interaction was no longer significant.

Family Care

Children in this study spent an average of 3.9 hours per week performing family care. Children performed as little as 14.7 minutes and as much as 30.9 hours of family care chores, when parent and child report was averaged. Separate means and standard deviations for parent and child report of family care performed by first-borns and second-borns based on the age and gender of the child and the

health status of the second-born in the family are displayed in Table 26 and 27, respectively.

In the model that compared first- and second-borns, family care scores were significantly different based on birth status, but not respondent or health status (Table 28). First-borns spent on average 1.2 more hours per week performing family care than second-borns. A significant two-way interaction between birth status and health status was also found but did not explain the main effect in any further detail. Both parents; $t(95)=-1.9$, $p=.05$; and children; $t(95)=-4.3$, $p=>.0001$; reported that first-borns performed more family care than second-borns.

First-borns' data, analyzed separately, revealed no significant differences in amount of family care performed based on gender; F $(1,88)=0.0$, $p=.9$; or age; F $(1,88)=0.5$, $p=.5$. Results of data analyzed separately about second-borns revealed no age or gender main effects, but a significant respondent effect. Parents perceived that second-borns performed an average of 30 minutes more family work per week than first-borns reported. A significant three-way interaction between health status, gender, and respondent also occurred. Parents reported that male second-borns with diabetes spent 1.6 more hours per week performing family care chores than male second-borns with no chronic illness; t $(39)= 2.2$, $p=.04$. Parents also reported that second-born boys with diabetes spent significantly more

time (1.6 hours more) performing family care chores than second-born females with diabetes; t (45)= 2.3, p=.03.

The amount of time second- and first-borns received help with family chores was compared (Table 30). Since, first-borns had performed more overall chores than second-borns, the percentage of time children received help was used, instead of actual time children received help. First-borns reported that second-borns received help a significantly greater percentage of the time than did first-borns; t (95)=4.3, p=>.0001. Parents did not perceive a significant difference in the amount of help their first- and second-born children received; t (95)=1.8, p=.07.

Additional Analyses

To clarify that the above birth order effects were not confounded by age, further analyses were performed. A subsample, first-borns (n=34) and second-borns (n=33) who were 9-11 years old were analyzed. The sibling care score (F=19.7, p=>.0001) was still significant different based on birth status. The family care score (F (1,59)=1.5, p=.22), self care score (F(1,59)=15.4, p=.9), and total score (F (1,59)=3.3, p= .08) were no longer significant different based on birth status.

Outside of Home Activities

Children in this study spent an average of 6.6 hours per week in outside of home activities. According to an average of parent and child report, some children did not

engage in any outside of home activities while others were engaged in as much as 29.8 hours a week of outside of home activities. Separate means and standard deviations for parent and child report of outside of home activity performed by first-borns and second-borns based on the age and gender of the child and the health status of the second-born in the family are displayed in Table 31 and 32, respectively.

To examine first-borns performance of activities compared to second-borns performance of activities, repeated measures ANOVAs were utilized (Table 33). Health status was removed from the model as it did not produce significant effects. First-borns performed an average of 2.1 more hours of outside of home activities compared to second-borns. A respondent by birth status effect was found. First-borns reported that they performed an average of 3.4 more hours of activities than second-borns; t (95)= -3.0, p=.004. Parents did not report a significant difference between first- and second-borns' performance of outside of home activities; t (95)=-0.3, p=.7. Parents reported that second-borns spent more time in outside of home activities than was reported by first-borns; t (95)=2.6, p=.01.

Separate repeated measures ANOVAs for first-borns' activities revealed no significant effects for health status and gender and these variables were removed from the model. There was a significant interaction between age and

respondent (Table 34). Age was only significantly positively related to amount of activities by child report. Adolescent first-borns reported that they engaged in an average of 10.5 hours of activities per week, while pre-adolescent first-borns reported that they engaged in an average of 6.2 hours per week; t (94)=-2.2, p=.04. On inspection of the means, first-born boys with a sibling with diabetes appeared to perform more activities than first-born females in these families and more than males with healthy siblings; however, this is not significant in the model.

Separate repeated measures ANOVAs for second-borns' activities are displayed in Table 35. Age was removed from the model as it did not produce significant effects. A respondent effect was confirmed; parents reported that second-borns engaged in more outside of home activities than was reported by first-borns. There was a significant health status by gender effect. Second-born males with diabetes engaged in an average of 9 hours of outside of home activities, while second-born females with diabetes engaged in an average of 3.4 hours of outside of home activities; t (42)=2.7, p=.02.

Additional Analyses

Children and parents were asked if they felt each sibling performed more, equal, or less chores than their peers (Table 36). There was no significant difference found between their response based on health status or birth

status. Approximately half of the siblings were reported to have performed the same amount of chores as their peers.

The amount of hours siblings spent with friends in the last two weeks was also collected. The older group of first-borns reported spending more time with friends in the last two weeks than the younger group of first-borns ($t=-2.6$, $p=.01$). There was no significant difference based on health status or gender.

TABLE 3

INTERVIEW INTER-RATER RELIABILITY

SCORES	MEAN (in hours) RATER 1	RATER 2	DIFF	CORR	T-TEST[2]
SIB (P-Y)	1.18	1.16	.02	.98[1]	.25
SIB (P-O)	4.24	4.32	-.08	.99[1]	-1.78
SIB (O-Y)	1.86	2.09	-.23	.96[1]	-.99
SIB (O-O)	5.00	5.04	-.04	1.00[1]	-.77
SELF (P-Y)	4.82	5.01	-.19	.99[1]	-1.94
SELF (P-O)	4.12	4.17	-.05	.99[1]	-.58
SELF (O-Y)	3.97	4.00	-.03	.99[1]	-.33
SELF (O-O)	3.84	3.91	-.07	.99[1]	-.80
FAMILY (P-Y)	4.40	4.49	-.09	.98[1]	-.73
FAMILY (P-O)	4.54	4.61	-.07	.98[1]	-.56
FAMILY (O-Y)	2.88	2.73	.15	.96[1]	1.00
FAMILY (O-O)	4.38	4.43	-.05	.95[1]	-.31
TOTAL (P-Y)	10.40	10.45	-.05	.98[1]	-.17
TOTAL (P-O)	12.91	13.08	-.17	.99[1]	-1.04
TOTAL (O-Y)	8.94	8.82	.12	.98[1]	.39
TOTAL (O-O)	13.98	13.87	.11	.96[1]	.19
ACT (P-Y)	4.90	4.70	.20	.97[1]	.55
ACT (P-O)	6.28	6.06	.22	.96[1]	1.08
ACT (O-Y)	5.30	5.36	-.06	1.00[1]	-.62
ACT (O-O)	7.52	7.61	-.09	1.00[1]	-.77

* P = parent; O = older child; Y = younger child; - = about
[1] $p<.0001$; [2] $p>.05$

TABLE 4

TEST-RETEST RELIABILITY

SCORES*	MEAN (in hours) TIME 1	TIME 2	DIFF	CORR	T-TEST
SIB (P-Y)	1.55	1.26	.29	.77[1]	.77
SIB (P-O)	4.68	3.75	.93	.92[1]	2.87[2]
SIB (O-Y)	1.35	.89	.46	.82[1]	1.42
SIB (O-O)	5.19	5.19	.00	.44[2]	.01
SELF (P-Y)	4.50	4.22	.38	.76[1]	.72
SELF (P-O)	3.82	3.47	.35	.62[1]	.79
SELF (O-O)	3.17	2.94	.23	.63[1]	.50
SELF (O-Y)	3.08	3.50	-.42	.77[1]	-1.10
FAMILY (P-Y)	4.19	4.02	.17	.57[2]	.37
FAMILY (P-O)	5.14	4.44	.70	.43[3]	1.10
FAMILY (O-Y)	3.06	2.82	.24	.62[1]	.57
FAMILY (O-O)	5.24	4.40	.84	.85[1]	1.73
TOTAL (P-Y)	10.24	9.49	.75	.68[1]	.81
TOTAL (P-O)	13.66	12.33	1.33	.86[1]	2.00[4]
TOTAL (O-Y)	7.75	6.68	1.07	.83[1]	1.63
TOTAL (O-O)	12.51	13.09	.42	.72[1]	.29
ACT (P-Y)	6.43	6.38	.05	.98[1]	.12
ACT (P-O)	8.27	7.88	.39	.92[1]	.72
ACT (O-Y)	5.31	4.31	1.00	.88[1]	1.90
ACT (O-O)	8.44	8.75	-.31	.71[1]	-.22

* P = parent; O = older child; Y = younger child; - = about
1 $p>.0001$; 2 $p=.01$; 3 $p=.02$; 4 $p=.05$

TABLE 5

PARENT-CHILD AGREEMENT

	MEAN (in hours) BY RESPONDENT			CORR	T-TEST
	PARENT	CHILD	DIFF		
SCORES*					
SIB (Y)	1.44	1.25	.19	.32[3]	.52
SIB (O)	3.83	4.72	-.89	.35[1]	-1.36
SELF (Y)	4.21	2.85	1.36	.45[1]	3.51[2]
SELF (O)	3.64	3.10	.54	.40[1]	1.69
FAMILY (Y)	3.48	3.05	.43	.26[4]	1.43
FAMILY (O)	4.19	4.81	-.62	.67[1]	-1.47
TOTAL (Y)	8.88	7.25	1.63	.39[1]	2.31[5]
TOTAL (O)	12.14	12.82	-.68	.41[1]	-.57
ACT (Y)	6.26	4.87	1.39	.58[1]	2.4[5]
ACT (O)	6.87	8.32	-1.45	.72[1]	-2.5[5]

* Y=about younger child; O=about older child
[1] $p<.0001$; [2] $p=.001$; [3] $p=.002$; [4] $p=.01$; [5] $p=.02$

TABLE 6

MEANS AND STANDARD DEVIATIONS OF HOURS OF TOTAL CHORES PERFORMED BY FIRST-BORNS

	FIRST-BORNS (n=96)
PARENT	
M	12.1
SD	(9.9)
CHILD	
M	12.8
SD	(11.4)

	DIABETES SIBLING (n=48)	HEALTHY SIBLING (n=48)
PARENT		
M	12.2	12.1
SD	(7.2)	(12.1)
CHILD		
M	12.3	13.3
SD	(9.3)	(13.2)

	8-12 YEAR OLDS (n=24)		13-16 YEAR OLDS (n=24)		8-12 YEAR OLDS (n=24)		13-16 YEAR OLDS (n=24)	
PARENT								
M	12.5		11.9		8.5		15.6	
SD	(7.7)		(6.8)		(8.1)		(14.4)	
CHILD								
M	9.9		14.7		13.1		13.5	
SD	(6.7)		(10.9)		(15.9)		(10.3)	
	MALE (n=14)	FEMALE (n=10)	MALE (n=11)	FEMALE (n=13)	MALE (n=12)	FEMALE (n=12)	MALE (n=12)	FEMALE (n=12)
PARENT								
M	12.9	12.1	11.4	12.4	10.0	7.1	10.6	20.5
SD	(8.3)	(7.1)	(6.6)	(7.2)	(10.5)	(4.6)	(9.4)	(17.2)
CHILD								
M	9.4	10.7	13.7	15.6	13.1	12.5	10.9	16.2
SD	(5.3)	(8.6)	(10.0)	(12.1)	(15.9)	(10.4)	(9.4)	(10.8)

TABLE 7

MEANS AND STANDARD DEVIATION OF HOURS OF TOTAL CHORES PERFORMED BY SECOND-BORNS

	SECOND-BORNS (n=96)
PARENT	
M	8.9
SD	(6.4)
CHILD	
M	7.2
SD	(6.1)

	DIABETES (n=48)	HEALTHY (n=48)
PARENT		
M	10.3	7.4
SD	(6.6)	(5.8)
CHILD		
M	8.7	5.8
SD	(6.6)	(5.2)

	5-9 YEAR OLDS (n=24)	10-15 YEAR OLDS (n=24)	5-9 YEAR OLDS (n=25)	10-15 YEAR OLDS (n=23)
PARENT				
M	10.8	9.8	7.4	8.5
SD	7.4	(5.8)	(5.8)	(5.9)
CHILD				
M	8.0	9.4	4.2	7.6
SD	(5.6)	(7.5)	(2.4)	(6.7)

	MALE (n=8)	FEMALE (n=16)	MALE (n=10)	FEMALE (n=14)	MALE (n=13)	FEMALE (n=12)	MALE (n=11)	FEMALE (n=12)
PARENT								
M	10.7	10.9	11.0	8.9	5.9	6.8	6.5	10.5
SD	(7.2)	(7.7)	(6.8)	(5.2)	(4.2)	(7.1)	(3.3)	(7.1)
CHILD								
M	7.8	8.1	8.8	9.8	3.7	4.6	8.5	6.7
SD	(5.6)	(5.7)	(9.8)	(5.8)	(2.5)	(2.2)	(7.7)	(5.9)

TABLE 8

TOTAL CHORES: COMPARISON OF FIRST- AND SECOND-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECT			
Health Status[1]	1.1 (4.9)	1,94	ns (.03)
WITHIN SUBJECTS EFFECTS			
Birth Order	27.3 (35.5)	1,94	<.0001
Respondent	0.4 (3.7)	1,94	ns (.06)
INTERACTION EFFECTS			
Health Status X Birth Order	3.9 (4.2)	1,94	.05 (.04)
Respondent X Birth Order[1]	3.6 (12.3)	1,94	.06 (.001)
Health Status X Respondent	0.1 (.02)	1,94	ns
Health Status X Birth Order X Respondent	0.2 (2.4)	1,94	ns

Note: Log transformation is shown in parentheses unless equivalent.
[1] Only significant with log transformation.

TABLE 9

TOTAL CHORES FOR FIRST-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Health Status	0.1 (0.7)	1,92	ns
Age[1]	2.5 (4.4)	1,92	.12 (.04)
WITHIN SUBJECTS EFFECT			
Respondent	0.3 (0.1)	1,92	ns
INTERACTION EFFECTS			
Health Status X Age	0.2 (0.9)	1,92	ns
Health Status X Respondent	0.3 (1.1)	1,92	ns
Age X Respondent	0.3 (0.0)	1,92	ns
Health Status X Age X Respondent	6.1 (6.0)	1,92	.01

Note: Log transformation is shown in parentheses unless equivalent.

[1] Only significant with log transformation.

TABLE 10

TOTAL CHORES FOR SECOND-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Health Status	8.2 (8.2)	1,94	.01 (.004)
WITHIN SUBJECTS EFFECT			
Respondent	5.3 (11.2)	1,94	.02 (.001)
INTERACTIONS			
Health Status X Respondent	0.0 (.45)	1,94	ns

Note: Log transformation is shown in parentheses unless equivalent.

TABLE 11

TOTAL CHORES: COMPARISON OF FIRST- AND SECOND-BORNS EXCLUDING DIABETES-RELATED SELF CARE TASKS

	F	DF	p
WITHIN SUBJECTS EFFECTS			
Birth Order	37.4 (53.3)	1,94	<.0001
Respondent[1]	.16 (4.4)	1,94	.7 (.04)
INTERACTION EFFECTS			
Respondent X Birth Order	7.63 (17.7)	1,94	.01 (<.0001)

Note: Log transformation is shown in parentheses unless equivalent.

[1] Interaction or main effect only significant with log transformation.

TABLE 12

TOTAL CHORES FOR SECOND-BORNS EXCLUDING DIABETES-RELATED SELF CARE TASKS

	F	DF	p
BETWEEN SUBJECTS EFFECT			
Age[2]	3.1 (4.1)	1,85	.08 (.05)
WITHIN SUBJECTS EFFECT			
Respondent	5.8 (12.8)	1,85	.02 (.001)
INTERACTION			
Age X Respondent	1.6 (0.1)	1,85	ns

Note: Log transformation is shown in parentheses unless equivalent.
[1] Interaction or main effect only significant with log transformation.

TABLE 13

MEANS AND STANDARD DEVIATIONS OF HOURS OF SIBLING CARE CHORES PERFORMED BY FIRST-BORNS

	FIRST-BORNS (n=96)
PARENT	
M	3.8
SD	(5.0)
CHILD	
M	4.7
SD	(6.2)

	DIABETES SIBLING (n=48)	HEALTHY SIBLING (n=48)
PARENT		
M	3.7	3.9
SD	(3.9)	(6.0)
CHILD		
M	4.8	4.6
SD	(6.5)	(6.1)

	8-12 YEAR OLDS (n=24)	13-16 YEAR OLDS (n=24)	8-12 YEAR OLDS (n=24)	13-16 YEAR OLDS (n=24)
PARENT				
M	3.5	4.0	3.1	4.8
SD	(3.7)	(4.1)	(5.1)	(6.7)
CHILD				
M	3.0	6.6	4.6	4.7
SD	(4.1)	(7.9)	(6.1)	(6.2)

	MALE (n=14)	FEMALE (n=10)	MALE (n=11)	FEMALE (n=13)	MALE (n=12)	FEMALE (n=12)	MALE (n=12)	FEMALE (n=12)
PARENT								
M	3.4	3.6	3.6	4.3	3.6	2.5	5.0	4.6
SD	(4.0)	(3.5)	(4.1)	(4.2)	(6.9)	(2.5)	(8.7)	(4.3)
CHILD								
M	1.8	4.7	7.1	6.2	4.8	4.3	4.8	4.6
SD	(2.4)	(5.4)	(9.4)	(6.7)	(6.7)	(5.9)	(7.2)	(5.3)

TABLE 14

MEANS AND STANDARD DEVIATION OF HOURS OF SIBLING CARE CHORES PERFORMED BY SECOND-BORNS

	SECOND-BORNS (n=96)
PARENT	
M	1.4
SD	(2.9)
CHILD	
M	1.3
SD	(3.3)

	DIABETES (n=48)	HEALTHY (n=48)
PARENT		
M	1.5	1.4
SD	(3.1)	(2.6)
CHILD		
M	1.4	1.2
SD	(3.5)	(3.1)

	5-9 YEAR OLDS (n=24)	10-15 YEAR OLDS (n=24)	5-9 YEAR OLDS (n=25)	10-15 YEAR OLDS (n=23)
PARENT				
M	1.1	2.0	1.3	1.4
SD	(2.2)	(3.8)	(3.0)	(2.3)
CHILD				
M	0.8	1.9	0.3	2.0
SD	(2.2)	(4.4)	(0.7)	(4.4)

	MALE (n=8)	FEMALE (n=16)	MALE (n=10)	FEMALE (n=14)	MALE (n=13)	FEMALE (n=12)	MALE (n=11)	FEMALE (n=12)
PARENT								
M	0.1	1.6	2.1	1.9	0.6	2.1	0.5	2.2
SD	(.2)	(2.6)	(5.0)	(2.9)	(1.1)	(4.1)	(0.7)	(2.9)
CHILD								
M	0.4	1.0	2.0	1.8	0.3	0.3	2.0	2.1
SD	(0.9)	(2.6)	(6.0)	(3.0)	(0.8)	(0.5)	(5.5)	(3.2)

TABLE 15

SIBLING CARE: COMPARISON OF FIRST- AND SECOND-BORNS

	F	DF	p
WITHIN SUBJECTS EFFECTS			
Birth Order	42.26 (113.5)	1,95	<.0001
Respondent	0.7 (3.1)	1,95	ns
INTERACTION EFFECTS			
Respondent X Birth Order[1]	2.9 (10.8)	1,95	.09 (.001)

Note: Log transformation is shown in parentheses unless equivalent.

[1] Only significant with log transformation.

TABLE 16

SIBLING CARE FOR FIRST-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECT			
Health Status	0.0 (0.1)	1,92	ns
Age	2.5 (0.7)	1,92	ns
WITHIN SUBJECTS EFFECTS			
Respondent	1.9 (0.5)	1,92	ns
INTERACTION EFFECTS			
Health Status X Age	0.3 (0.1)	1,92	ns
Health Status X Respondent	0.1 (1.48)	1,92	ns
Age X Respondent	0.3 (0.4)	1,92	ns
Health Status X Age X Respondent[1]	3.1 (7.0)	1,92	.08 (.01)

Note: Log transformation is shown in parentheses unless equivalent.

[1] Only significant with log transformation.

TABLE 17

SIBLING CARE FOR SECOND-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECT			
Gender[1]	1.4 (4.8)	1,94	.2 (.03)
WITHIN SUBJECTS EFFECTS			
Respondent[1]	0.1 (9.1)	1,94	.7 (.003)
INTERACTION EFFECTS			
Gender X Respondent	1.5 (1.9)	1,94	ns

Note: Log transformation is shown in parentheses unless equivalent.
[1] Only significant with log transformation.

TABLE 18

MEANS AND STANDARD DEVIATIONS OF HOURS OF SELF CARE CHORES PERFORMED BY FIRST-BORNS

	FIRST-BORNS (n=96)
PARENT	
M	3.6
SD	(2.9)
CHILD	
M	3.1
SD	(2.7)

	DIABETES SIBLING (n=48)	HEALTHY SIBLING (n=48)
PARENT		
M	4.1	3.2
SD	(3.0)	(2.7)
CHILD		
M	3.2	3.0
SD	(2.9)	(2.5)

	8-12 YEAR OLDS (n=24)	13-16 YEAR OLDS (n=24)	8-12 YEAR OLDS (n=24)	13-16 YEAR OLDS (n=24)
PARENT				
M	4.3	3.9	2.1	4.2
SD	(3.4)	(2.7)	(1.3)	(3.3)
CHILD				
M	2.8	3.6	2.5	3.5
SD	(2.7)	(3.2)	(2.8)	(2.0)

	MALE (n=14)	FEMALE (n=10)	MALE (n=11)	FEMALE (n=13)	MALE (n=12)	FEMALE (n=12)	MALE (n=12)	FEMALE (n=12)
PARENT								
M	4.6	3.8	3.4	4.4	1.8	2.4	2.6	5.8
SD	(4.3)	(1.6)	(1.8)	(3.2)	(1.2)	(1.4)	(1.6)	(3.9)
CHILD								
M	3.4	2.1	2.4	4.7	2.5	2.4	2.4	4.5
SD	(3.3)	(1.0)	(1.4)	(3.9)	(3.7)	(1.7)	(1.6)	(1.9)

TABLE 19

MEANS AND STANDARD DEVIATION OF HOURS OF SELF CARE CHORES PERFORMED BY SECOND-BORNS

	SECOND-BORNS (n=96)
PARENT	
M	4.2
SD	(4.1)
CHILD	
M	2.8
SD	(2.9)

	DIABETES (n=48)	HEALTHY (n=48)
PARENT		
M	5.1	3.3
SD	(3.5)	(4.4)
CHILD		
M	4.1	1.6
SD	(3.5)	(1.3)

	5-9 YEAR OLDS (n=24)	10-15 YEAR OLDS (n=24)	5-9 YEAR OLDS (n=25)	10-15 YEAR OLDS (n=23)
PARENT				
M	5.7	4.5	2.0	4.8
SD	(4.2)	(2.6)	(1.4)	(5.9)
CHILD				
M	3.5	4.7	1.2	2.4
SD	(2.8)	(4.1)	(1.1)	(1.5)

	MALE (n=8)	FEMALE (n=16)	MALE (n=10)	FEMALE (n=14)	MALE (n=13)	FEMALE (n=12)	MALE (n=11)	FEMALE (n=12)
PARENT								
M	5.4	5.9	4.8	4.3	1.9	2.0	3.1	6.3
SD	(5.0)	(3.9)	(2.9)	(2.5)	(1.6)	(1.2)	(2.5)	(7.7)
CHILD								
M	3.1	3.7	4.8	4.6	1.1	1.2	2.5	1.6
SD	(2.0)	(3.2)	(5.0)	(3.5)	(0.7)	(1.4)	(1.3)	(1.5)

TABLE 20

SELF CARE: COMPARISON OF FIRST- AND SECOND-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Health Status[1]	1.2 (14.5)	1,94	.3 (.0001)
WITHIN SUBJECTS EFFECTS			
Birth Order1	1.0 (4.1)	1,94	.3 (.05)
Respondent[1]	1.1 (25.4)	1,94	.3 (.0001)
INTERACTION EFFECTS			
Health Status X Birth Order[1]	.92 (8.71)	1,94	.3 (.004)
Health Status X Respondent	1.0 (.03)	1,94	ns
Birth Order X Respondent[1]	1.0 (4.5)	1,94	.3 (.04)
Health Status X Birth Order X Respondent[1]	1.0 (10.6)	1,94	.3 (.002)

Note: Log transformation is shown in parentheses unless equivalent.

[1] Interaction or main effect only significant with log transformation.

TABLE 21

SELF CARE FOR FIRST-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Health Status	1.9 (2.6)	1,88	ns
Age	3.4 (6.5)	1,88	.07 (.01)
Gender[1]	3.9 (5.5)	1,88	.05 (.02)
WITHIN SUBJECTS EFFECTS			
Respondent[1]	2.9 (4.7)	1,88	.09 (.03)
INTERACTION EFFECTS			
Health Status X Age[1]	2.5 (5.8)	1,88	.1 (.02)
Health Status X Respondent	1.1 (2.4)	1,88	ns
Age X Respondent	0.01(0.5)	1,88	ns
Gender X Respondent	0.2 (0.0)	1,88	ns
Health Status X Age X Respondent	3.2 (1.7)	1,88	ns

Note: Log transformation is shown in parentheses unless equivalent.
[1] Interaction or main effect only significant with log transformation.

TABLE 22

SELF CARE FOR SECOND-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Health Status	13.0(18.2)	1,92	.001(>.0001)
Age[1]	2.6 (6.0)	1,92	.1 (.02)
WITHIN SUBJECTS EFFECTS			
Respondent	13.5(35.3)	1,92	<.0001
INTERACTION EFFECTS			
Health Status X Age	2.8 (2.4)	1,92	ns
Health Status X Respondent[1]	1.0 (6.0)	1,92	.3 (.02)
Age X Respondent	.1 (.5)	1,92	ns
Health Status X Age X Respondent[1]	8.3 (.7)	1,92	.4 (.005)

Note: Log transformation is shown in parentheses unless equivalent.
[1] Interaction or main effect only significant with log transformation.

TABLE 23

SELF CARE: COMPARISON OF FIRST- AND SECOND-BORNS EXCLUDING DIABETES-RELATED TASKS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Health Status	4.2 (6.0)	1,94	.04 (.02)
WITHIN SUBJECTS EFFECTS			
Birth Order	10.5 (20.6)	1,94	.002 (<.0001)
Respondent	9.9 (23.6)	1,94	.002 (<.0001)
INTERACTION EFFECTS			
Health Status X Birth Order	0.7 (2.8)	1,94	ns
Health Status X Respondent	0.2 (0.1)	1,94	ns
Birth Order X Respondent[1]	3.5 (10.9)	1,94	.07 (<.0001)

Note: Log transformation is shown in parentheses unless equivalent.
[1] Interaction or main effect only significant with log transformation.

TABLE 24

SELF CARE FOR FIRST-BORNS EXCLUDING DIABETES-RELATED TASKS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Gender[1]	3.3 (4.5)	1,92	.07 (.04)
Age[1]	3.5 (6.3)	1,92	.06 (.02)
WITHIN SUBJECTS EFFECTS			
Respondent	2.9 (4.8)	1,92	.09 (.03)
INTERACTION EFFECTS			
Gender X Age	8.6 (4.4)	1,92	.004 (.04)
Gender X Respondent	0.1 (0.2)	1,92	ns
Age X Respondent	0.01(0.6)	1,92	ns

Note: Log transformation is shown in parentheses unless equivalent.
[1] Interaction or main effect only significant with log transformation.

TABLE 25

SELF CARE FOR SECOND-BORNS EXCLUDING DIABETES-RELATED TASKS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Health Status	5.5 (6.8)	(1,92)	.02 (.01)
Age	3.6 (8.9)	(1,92)	.06 (.004)
WITHIN SUBJECTS EFFECT			
Respondent	16.0 (30.6)	(1,92)	<.0001
INTERACTIONS			
Health Status X Respondent	.1 (4.7)	(1,92)	ns
Age X Respondent	.8 (1.4)	(1,92)	ns

Note: Log transformation is shown in parentheses unless equivalent.

TABLE 26

MEANS AND STANDARD DEVIATIONS OF HOURS OF FAMILY CARE CHORES PERFORMED BY FIRST-BORNS

	FIRST-BORNS (n=96)
PARENT	
M	4.2
SD	(3.4)
CHILD	
M	4.8
SD	(5.5)

	DIABETES SIBLING (n=48)	HEALTHY SIBLING (n=48)
PARENT		
M	4.4	4.0
SD	(2.9)	(3.9)
CHILD		
M	4.3	5.3
SD	(2.9)	(7.3)

	8-12 YEAR OLDS (n=24)	13-16 YEAR OLDS (n=24)	8-12 YEAR OLDS (n=24)	13-16 YEAR OLDS (n=24)
PARENT				
M	4.8	4.0	3.5	4.4
SD	(3.2)	(2.5)	(3.7)	(4.1)
CHILD				
M	4.1	4.5	5.4	5.3
SD	(2.8)	(3.0)	(8.6)	(5.8)

	MALE (n=14)	FEMALE (n=10)	MALE (n=11)	FEMALE (n=13)	MALE (n=12)	FEMALE (n=12)	MALE (n=12)	FEMALE (n=12)
PARENT								
M	4.8	4.6	4.5	3.6	4.6	2.5	3.0	5.9
SD	(3.4)	(3.0)	(2.7)	(2.3)	(4.9)	(1.5)	(1.7)	(5.2)
CHILD								
M	4.2	4.0	4.2	4.7	6.4	4.4	3.7	6.9
SD	(2.4)	(3.5)	(2.0)	(3.8)	(11.9)	(3.7)	(2.7)	(7.5)

TABLE 27

MEANS AND STANDARD DEVIATION OF HOURS OF FAMILY CARE CHORES PERFORMED BY SECOND-BORNS

	SECOND-BORNS (n=96)
PARENT	
M	3.5
SD	(2.4)
CHILD	
M	3.0
SD	(2.5)

	DIABETES (n=48)	HEALTHY (n=48)
PARENT		
M	3.7	3.3
SD	(2.5)	(2.4)
CHILD		
M	3.1	3.0
SD	(2.6)	(2.4)

	5-9 YEAR OLDS (n=24)	10-15 YEAR OLDS (n=24)	5-9 YEAR OLDS (n=25)	10-15 YEAR OLDS (n=23)
PARENT				
M	4.0)	3.4	3.1	3.5
SD	(2.7)	(2.3)	(2.6)	(2.1)
CHILD				
M	3.4	2.8	2.5	3.5
SD	(3.0)	(2.2)	(1.6)	(3.0)

	MALE (n=8)	FEMALE (n=16)	MALE (n=10)	FEMALE (n=14)	MALE (n=13)	FEMALE (n=12)	MALE (n=11)	FEMALE (n=12)
PARENT								
M	5.2	3.4	4.2	2.8	3.4	2.8	2.9	4.0
SD	(3.1)	(2.4)	(2.8)	(1.7)	(2.5)	(2.7)	(1.6)	(2.4)
CHILD								
M	3.5	3.4	2.0	3.4	2.3	2.7	4.0	3.0
SD	(3.9)	(2.5)	(1.2)	(2.6)	(1.7)	(1,6)	(2.8)	(3.2)

TABLE 28

FAMILY CARE FOR COMPLETE SAMPLE

	F	DF	p
WITHIN SUBJECTS EFFECT			
Birth Order	9.5 (14.4)	1,95	.003 (.0001)
Respondent	.10 (.2)	1,95	ns
INTERACTION EFFECT			
Birth Order X Respondent	4.7 (7.7)	1,95	.03 (.007)

Note: Log transformation is shown in parentheses unless equivalent.

TABLE 29

FAMILY CARE FOR SECOND-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Health Status	.6 (.7)	1,92	ns
Gender	.2 (.2)	1,92	ns
WITHIN SUBJECTS EFFECTS			
Respondent[1]	3.6(4.0)	1,92	.06 (.05)
INTERACTION EFFECTS			
Health Status X Gender	.2 (.5)	1,92	ns
Health Status X Respondent	.8 (.1)	1,92	ns
Gender X Respondent	2.1(1.6)	1,92	ns
Health Status X Gender X Respondent	5.4(5.9)	1,92	.02

Note: Log transformation is shown in parentheses unless equivalent.

[1] Interaction or main effect not significant with log transformation.

TABLE 30

MEAN PERCENTAGE OF FAMILY CHORES PERFORMED WITH HELP FROM OTHER FAMILY MEMBERS

	Parent Report	Child Report
First-born	47%	42%[1]
Second-born	53%	57%[1]

[1] Significantly different at $p = >.0001$.

TABLE 31

MEANS AND STANDARD DEVIATIONS OF HOURS OF OUTSIDE OF HOME ACTIVITY PERFORMED BY FIRST-BORNS

	FIRST-BORNS (n=96)
PARENT	
M	6.9
SD	(6.1)
CHILD	
M	8.3
SD	(8.3)

	DIABETES SIBLING (n=48)	HEALTHY SIBLING (n=48)
PARENT		
M	7.1	6.7
SD	(6.7)	(5.6)
CHILD		
M	9.1	7.6
SD	(9.8)	(6.5)

	8-12 YEAR OLDS (n=24)	13-16 YEAR OLDS (n=24)	8-12 YEAR OLDS (n=24)	13-16 YEAR OLDS (n=24)
PARENT				
M	6.6	7.5	6.9	6.4
SD	(8.2)	(4.8)	(5.8)	(5.4)
CHILD				
M	5.9	12.3	6.5	8.6
SD	(7.7)	(10.8)	(6.4)	(6.6)

	MALE (n=14)	FEMALE (n=10)	MALE (n=11)	FEMALE (n=13)	MALE (n=12)	FEMALE (n=12)	MALE (n=12)	FEMALE (n=12)
PARENT								
M	8.3	4.3	7.8	7.3	7.5	6.3	5.2	7.6
SD	(10.0)	(4.2)	(4.3)	(5.4)	(7.2)	(4.2)	(4.3)	(6.3)
CHILD								
M	7.9	3.0	14.7	10.2	6.2	6.9	7.0	10.2
SD	(9.1)	(4.2)	(12.3)	(9.3)	(7.1)	(5.9)	(5.7)	(7.3)

TABLE 32

MEANS AND STANDARD DEVIATIONS OF HOURS OF OUTSIDE OF HOME ACTIVITIES PERFORMED BY SECOND-BORNS

	SECOND-BORNS (n=96)
PARENT	
M	6.2
SD	(6.7)
CHILD	
M	4.9
SD	(5.4)

	DIABETES (n=48)	HEALTHY (n=48)
PARENT		
M		
SD	6.3 (7.8)	6.2 (5.4)
CHILD		
M		
SD	4.7 (5.2)	5.0 (5.5)

	5-9 YEAR OLDS (n=24)	10-15 YEAR OLDS (n=24)	5-9 YEAR OLDS (n=25)	10-15 YEAR OLDS (n=23)
PARENT				
M				
SD	5.4 (8.4)	7.2 (7.4)	6.0 (4.5)	6.5 (6.3)
CHILD				
M				
SD	2.6 (3.2)	6.8 (6.0)	4.8 (4.6)	5.2 (6.5)

	MALE (n=8)	FEMALE (n=16)	MALE (n=10)	FEMALE (n=14)	MALE (n=13)	FEMALE (n=12)	MALE (n=11)	FEMALE (n=12)
PARENT								
M								
SD	9.5 (12.7)	3.4 (4.4)	11.6 (9.3)	4.0 (3.1)	6.0 (4.9)	5.9 (4.3)	5.7 (5.0)	7.3 (7.4)
CHILD								
M								
SD	4.8 (4.1)	1.5 (1.9)	9.6 (7.0)	4.9 (4.5)	5.0 (5.1)	4.6 (4.2)	4.8 (5.3)	5.6 (7.7)

TABLE 33

ACTIVITY SCORES FOR COMPLETE SAMPLE

	F	DF	p
WITHIN SUBJECTS EFFECTS			
Birth Order	9.8 (3.7)	1,95	.002 (.06)
Respondent	.00 (2.0)	1,95	ns
INTERACTION EFFECTS			
Birth Order X Respondent	16.4 (5.8)	1,95	<.001(.02)

Note: Log transformation is shown in parentheses unless equivalent.

TABLE 34

ACTIVITY SCORES FOR FIRST-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Age	2.7 (1.3)	1,94	ns
Respondent	6.7 (.1)	1,94	.01 (.8)
INTERACTION EFFECT			
Age X Respondent	14.2 (6.0)	1,94	<.0001 (.02)

Note: Log transformation is shown in parentheses unless equivalent.

TABLE 35

ACTIVITY SCORES FOR SECOND-BORNS

	F	DF	p
BETWEEN SUBJECTS EFFECTS			
Health Status	.3 (.00)	1,92	ns
Gender	6.1 (2.0)	1,92	.02 (.2)
WITHIN SUBJECTS EFFECTS			
Respondent	6.6 (.4)	1,92	.01
INTERACTION EFFECTS			
Health Status X Gender	8.5 (5.0)	1,92	.005 (.03)
Gender X Respondent	.8 (0.1)	1,92	ns
Health Status X Respondent	.4 (.4)	1,92	ns

Note: Log transformation is shown in parentheses unless equivalent.

TABLE 36

PERCEPTIONS OF THE AMOUNT OF CHORES PERFORMED COMPARED TO PEERS

	Parent Report	Child Report
First-born		
More	33%	29%
Equal	27%	49%
Less	37%	21%
Don't Know	3%	1%
Second-born		
More	22%	23%
Equal	49%	42%
Less	29%	33%
Don't Know	0%	2%

CHAPTER 7

DISCUSSION

Previous research has not examined sibling roles in families where one child has diabetes. This study assessed parent and child perceptions of the division of household labor and performance of extracurricular activities of first-borns and their younger siblings who were either healthy or had diabetes. These perceptions were ascertained from a structured interview revised for this study (Stoneman et al., 1988). Household responsibilities were categorized into three types: self care, sibling care, and family care. These categories accounted for development shifts (Goodnow & Delaney, 1989) and gender differences (Goodnow et al., 1991; Lawrence & Wozniak, 1987) in the types of chores children perform.

Reliability

The structured interview was found to be a reliable measure, yielding total scores that were more stable than category scores. However, the only scores that were significantly different on retest were parent report of first-borns' involvement in sibling care and total chores. Either parents provided a more cursory estimate of their child's chores during the second interview or they may have

felt that their initial report was an exaggeration of actual performance.

Sample Characteristics

Families in the diabetes and control group were well-matched on important demographic variables. The only exception was the hours of maternal employment. Mothers with a child with diabetes worked significantly fewer hours than mothers with two healthy children. Like previous research by Goodnow & Delaney (1989) and Peters & Haldeman (1987), hours of maternal employment was not associated with the amount of actual time children spent performing chores. Other research has found an association between children's household responsibilities and employment status of their mothers (Blair, 1992; Cogler & Tasker, 1982).

The children with diabetes had few hospitalizations and school absences related to their chronic illness, suggesting that these children were not severely compromised medically by their illness. This was expected as the children had been diagnosed with diabetes an average of only two years. Serious complications including retinopathy, nephropathy, neuropathy, and limited joint mobility, are more likely to occur as the number of years since diagnosis increase and typically do not occur until after puberty (Chase, 1995).

Household Responsibilities

Children in this study engaged in approximately 10.3 hours of total chores per week, with high variability in the

number of hours reported. Two outliers who performed more than 40 hours of household chores were retained in the analyses. While this appears to be an inordinant amount of work, these children were retained because measurements were being made of respondents' perceptions of the amount of work rather than observations of actual work performed.

In general the number of hours reported in this study is higher than previous reports of 3.5 to 8.4 hours per week (Blair; 1992; Cogle & Tasker, 1982; Sanik, 1981) and is most likely a result of obtaining complete reports. For instance, Blair (1992) found that children performed an average of 7 hours per week of chores but did not include child care responsibilities in his estimate.

Respondent Effects

Contrary to the first hypothesis, first-borns and parents had similar perceptions of the amount of chores performed by the first-borns. Nevertheless, first-borns perceived that their younger siblings spent less time performing chores in most areas compared to their parent's perceptions. This supported the second part of the hypothesis and suggested that children may underestimate the amount of work done by their siblings. However, it is also possible that parents "equalize" their children's efforts and do not see the discrepancies that actually exist.

Health Status Effects

There was no indication that older siblings' performance of household responsibilities was affected by having a younger sibling with diabetes. These children performed similar amounts of chores compared to first-borns with healthy siblings. Results were contrary to the study's hypotheses and to previous research on older siblings of children who were mentally retarded who were found to perform more child care than their peers with healthy siblings (Stoneman et al., 1988). Most likely, the inconsistent findings were a result of the children with diabetes having more ability to care for themselves than children with mental retardation.

Furthermore, children with diabetes were seen as "super" capable. Unexpectedly, these children performed more, not fewer, chores than healthy peers. That is, they performed the same amount of chores as healthy peers plus their diabetes self care. Parents were not reluctant to assign typical household responsibilities in addition to their children's extensive daily medical regimen.

Age effects

Consistent with previous research (Cogle & Tasker, 1981; Lawrence & Wozniak, 1987; White & Brinkerhoff, 1981b), age was positively associated with first-borns performance of total chores. When diabetes-related tasks were removed from the analyses, age was also positively related to

second-borns performance of total chores. Diabetes-related self care appeared to be an extra responsibility for second-borns who had diabetes, regardless of the child's age. Research has shown that developmentally, self care is the first type of chore children are expected to perform (Goodnow & Delaney, 1989); children with diabetes just have more self care responsibilities than most children.

Birth Order Effects

First-borns in this study performed more chores than second-borns. First- and second-borns of similar ages (9-11 year olds) were compared in an attempt to differentiate age and birth status effects, which had not been attempted in the past. Findings indicated that first-borns continued to perform more sibling care but no longer performed more family care or total chores compared to same-aged second-borns. Daniels & Plomin (1985) also found that older siblings performed more caretaking responsibilities than their younger siblings. The current study suggested that sibling care roles are most likely to be influenced by the birth status of the child; while other household responsibilities are more likely to be determined by the child's age.

Gender Effects

Female first-borns performed significantly more self care but not more total, sibling care, or family care chores. Second-born females performed more child care than

second-born males. This suggests that more is expected of female children in terms of child care at an earlier age than male children. Gender was not found to be as strong a predictor of household chores as in past research (Blair, 1992; Lawrence & Wozniak, 1987; Stoneman et al., 1988). This may be suggestive of society's shift toward more egalitarian roles for males and females.

Gender by Health Status Effects

First-born males and females who had younger siblings with diabetes were not expected to take on more responsibilities than their healthy, same-sex peers. Again, this is contrary to Stoneman et al.'s (1986) study which found that a younger sibling with mental retardation increased the responsibility of the older, healthy, female and male siblings. However, the children with diabetes were fully functional while the children in Stoneman's study had greater limitations.

Gender by Health Status by Age

As expected, in the healthy sample, adolescent female first-borns averaged substantially more hours of total chores than adolescent male first-borns. However, this did not reach significance, probably because there was only 12 subjects in each group and high variability in the amount of chores performed. Further, gender differences were not apparent for first-borns who had younger siblings with

diabetes. Diabetes in the family appeared to equalize what was expected of older male and female siblings.

Respondent by Age by Health Status

Parents perceived preadolescent first-borns who had a younger sibling with diabetes to perform more total chores than they reported about themselves. According to parent report, these children performed more household responsibilities than preadolescent first-borns with a healthy sibling. This is the only finding that supported the primary hypothesis that having a child with diabetes in the family increased the household responsibilities of the eldest, healthy sibling. In the eyes of the parents, having a younger child with diabetes appeared to equalize the amount of chores performed between preadolescent and adolescent first-borns.

Outside of Home Activities

Children in this study engaged in an average of 6.6 hours. The sample had high variability, with some children engaged in no activities while other children engaged in as much as 29.8 hours of outside of home activities.

Gender by Health Status Effects

Opposite to what was expected, male first-borns who had a younger sibling with diabetes did not engage in more peer activities than female first-borns who had a younger sibling with diabetes. This had been found for the male first-borns who had a younger sibling who was mentally retarded in

Stoneman et al. (1988) study. As with the household responsibilities, first-borns involvement in extracurricular activities was not affected by having a younger sibling with diabetes.

An interesting and unexpected finding was found for the second-borns with diabetes. Second-born boys with diabetes were found to perform more outside of home activities than healthy second-born boys or second-born girls with diabetes. Although this reasoning is speculative, parents may have emphasized involvement in sports and outside of home activities for boys to make them feel more "normal" or just like their peers. On the other hand, parents may have been more cautious with their daughters who had diabetes focusing more on the possible short-term complications.

Respondent Effects

First-borns thought that they engaged in significantly more outside of home activities than was reported by parents and that second-borns engaged in significantly fewer outside of home activities than was reported by parents. This may be due to parents wanting to believe that they treat their children equally regardless of age. Or perhaps, children exaggerate what they do and underestimate what others do.

Implications

Overall, this study suggested that older siblings of children with diabetes were not adversely impacted by having an ill child in the family. However, according to parents,

having a child with diabetes appeared to equalize the effect of gender and age for first-borns. Parents who have a younger child who copes with an extensive daily regimen, may in turn expect their healthy first-born child to take on more responsibilities at a younger age. Interestingly, these children do not perceive any added responsibility.

On the other hand, children with diabetes are not taking a sick role in regards to their household responsibilities. These children performed their diabetes self care in addition to their typical household chores. Health care providers who work with children with diabetes should be aware that diabetes self care is an additional responsibility or chore for a child, which in most cases does not reduce the child's other responsibilities. Parents and health professionals should set reasonable expectations for these children based on their level of skill and maturity as the inclination may be to expect more from these children at younger ages.

Chores are seen by many parents as a means of developing character, future skills and responsibility (Goodney & Delaney, 1989; White & Brinkerhoff, 1981a). The added responsibility taken on at earlier ages by children in families where one child has diabetes may enhance their personal growth. However, it may also be overwhelming for a child who is not mature enough to handle the extra responsibility.

Limitations

A limitation of this study is the use of only one chronic illness group, children with diabetes. A comparison with other chronic illnesses that are considered more severely debilitating, such as an illness that is acutely life threatening (e.g., cancer) or is highly visible (e.g., spina bifida) may have yielded very different findings.

The second-born data was additional data gathered in a less controlled manner. For this group, age and sex were allowed to vary. Therefore, second-borns were not matched by age and sex between the diabetes and healthy groups. Consequently, these results may be less reliable.

In self-report data, it is best to obtain information from multiple sources. In this study, it is unclear what caused the difference between child and parent report. The second-born perspective or observational measure would have helped clarify differences.

Future Research

A next step in understanding sibling's roles in families where one child has a chronic illness is to examine the outcomes of siblings of children with other chronic illnesses. A comparative study of illnesses would be the most informative but individual studies of different chronic illnesses would also add to this line of research.

Another area of research is to examine the household responsibilities and outside of home activities of children

with diabetes in a more controlled way. Of particular interest is the effect of diabetes on the outside of home activities of male versus female children.

APPENDIX A

STRUCTURED INTERVIEW

Household Responsibilities

Interviewers instructions. "We will be asking you to recall the household activities that (you, child"s name) performed in the last month. First, we will talk about chores that children perform to care for their brother or sister. I will read you a list of tasks. Please tell me if _____ (you, child"s name) performed this task in the last month. If yes, ask the person, "How often did the child perform the task? (per week/per month) and "The last time _____ (your, child"s name) performed the task how long did the chore take (hours) ?" When you are finished with the items listed probe for other chores that the child performed that also fit into the category and ask the same questions as above.

"Now I will read you a list that children perform to care for themselves" Then, follow the same procedure as when asking about the sibling care items. When that is complete, say "Now I will read you a list of chores that children perform to help the family." Follow the same procedure as the sibling care items with an additional question about help. For items that the child performed, ask "Do/Does (child"s name, you) perform this alone or with help?. If the child gets help, ask "Do/Does (child"s name, you) get help from a parent or a brother/sister?"

SIBLING CARE

	How long?		How often?
1. babysit brother or sister when parent(s) are not at home	YES	NO	_____
2. watch brother or sister when parent(s) are at home	YES	NO	_____
3. help brother or sister with homework	YES	NO	_____
4. clean brother or sister's room	YES	NO	_____
5. pick up after brother or sister	YES	NO	_____
6. take care of brother or sister when brother or sister is ill	YES	NO	_____
7. help dress brother or sister	YES	NO	_____
8. prepare food for brother or sister	YES	NO	_____
9. get brother or sister ready for bed (eg., read story)	YES	NO	_____
10. bathe or wash hair of brother or sister	YES	NO	_____
Only for siblings of children with IDDM:			
A. Gives sibling insulin shots	YES	NO	_____
B. Helps child test blood glucose	YES	NO	_____

Other tasks child performs to help with sibling care?

8. _____ _____
9. _____ _____
10. _____ _____
11. _____ _____
12. _____ _____
13. _____ _____
14. _____ _____
15. _____ _____

SELF CARE (Please follow same guidelines as sibling care items)

	How long?		How often?
1. make own bed	YES	NO	_____
2. hang up own clothes	YES	NO	_____
3. clean their bedroom	YES	NO	_____
4. wash their own clothes	YES	NO	_____
5. prepare meals (breakfast, lunch, dinner) for self	YES	NO	_____
Only for children with IDDM:			
A. insulin injections	YES	NO	_____
B. blood testing	YES	NO	_____

Other self care tasks that child performs?

6. _____ _____
7. _____ _____
8. _____ _____
9. _____ _____
10. _____ _____
11. _____ _____
12. _____ _____

FAMILY CARE TASKS

	Help*		How long?		How often?
1. cook meals for family	P	S	YES	NO	_____
2. set table for meals or clears table	P	S	YES	NO	_____
3. wash dishes	P	S	YES	NO	_____
4. cleans (e.g., dusts, vacuum, sweep, clean bathroom)	P	S	YES	NO	_____
5. do laundry	P	S	YES	NO	_____
6. shop for food for household	P	S	YES	NO	_____
7. wash car	P	S	YES	NO	_____
8. mow lawn	P	S	YES	NO	_____
9. help in yard or garden	P	S	YES	NO	_____
10. water house plants	P	S	YES	NO	_____
11. take care of pets	P	S	YES	NO	_____

12. pick up around house	P	S	YES NO	_____
13. take out the garbage	P	S	YES NO	_____

Other household tasks child performs for the family:

14. _____	P	S	_____
15. _____	P	S	_____
16. _____	P	S	_____
17. _____	P	S	_____
18. _____	P	S	_____
19. _____	P	S	_____
20. _____	P	S	_____
21. _____	P	S	_____

*P=Parent, S=Sibling.

"Do you feel _____(you, your child) performs more, less, or the same amount of household chores as _____ (your friends, your peers/ his/her friends, his/her peers)?
_____

Outside of home activities

" What activities did _____ (target child"s name, you, your brother or sister) participate in outside of the home in the last month?" Use prompts such as after school activities, sports, hobbies, church activities, etc. When you are sure you have queried their outside activities enough, ask "The last time _____ did this activity, how much time (hours) did _____ (target child) spend?" and "How often per week they usually participate in this activity?"

Activities	How often?	How long?
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	
_____	_____	

How many hours has _____ spent with friends in the last week? _____

"Do you feel _____(you, your child) spends (more, less, or the same amount of time) as _____(your friends, your peers/ his/her friends, his/her peers) in outside of home activities?
_____

APPENDIX B

BACKGROUND INFORMATION

Please circle the appropriate answer or fill in the blank

1. You are the children's:

Mother Father Other--please, specify _____

2. List sex (M=Male, F=Female) and date of birth (DOB) of each child living in home?

	SEX		DOB		SEX		DOB
1.	M	F	_____	4.	M	F	_____
2.	M	F	_____	5.	M	F	_____
3.	M	F	_____	6.	M	F	_____

3. What is the highest grade you completed? _____

4. What is the highest grade your spouse completed? _____

5. Who do the children live with?

Mother and Father Mother only Father only

Father and Stepmother Mother and Stepfather

Foster Parents Other---please, specify_____

6. Do you have a job? YES NO

If yes, what is your job?_____

How many hours do you work a week? _____

7. Does your spouse have a job? YES NO

If yes, what is your spouse's job?_____

How many hours do you work a week? _____

8. Race:

White African-American Asian/Pacific Islander

Hispanic Native American Other-please, specify_____

9. Does anyone in your family have a chronic illness (who is living in the home)? YES NO

If yes, please list what the illness is and who has the illness in relation to the oldest child in the family? (mother, father, brother, sister)

_____

_____

_____

APPENDIX C

Health Status Questionnaire (For Diabetes Group only)

1. When was your child first diagnosed with diabetes? _____

2. How many hospitalizations has your child had in the last year for diabetes ketoacidosis or other complications related to diabetes? _____

3. How many days did your child miss school due to their diabetes?
_____

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BIOGRAPHICAL SKETCH

Cheryl Halpern Colvin graduated from the State University of New York at Binghamton with a Bachelor of Arts degree in psychology. She received a master's degree from the University of Florida in Gainesville in clinical and health psychology in 1992. Her master's thesis explored the attitudes of health professionals toward individuals with HIV.

In August 1995, Cheryl Halpern Colvin completed her internship at Schneider Children's Hospital at Long Island Jewish Hospital. She is currently completing a fellowship in pediatric psychology at Schneider Children's Hospital. Her primary research interest is the effect of chronic illness on families, with a particular interest in families with a child who has insulin-dependent diabetes.